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EUROPE AND THE NORTH WEST



W. O. G. CHISHOLM, F.R.S.

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E U R O P E

VOL. II
THE NORTH-WEST

BY
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FELLOW OF THE ROYAL GEOGRAPHICAL AND STATISTICAL SOCIETIES

MAPS AND ILLUSTRATIONS

LONDON: EDWARD STANFORD

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PREFACE

IN the present volume the same point of view has been maintained as in the first volume on the same continent. The aim has been to show to some extent how geographical conditions have affected the course of history, and this aim has determined the order in which the countries are treated, as well as the arrangement under each country.

For assistance in this, as in the previous volume, I am greatly indebted to my friend, Mr. J. T. Bealby, B.A., translator of Sven Hedin's *Through Asia*. His intimate knowledge of the Fen Country in England, as well as of the Scandinavian countries and literatures, made me glad of the opportunity of entrusting to him the preparation of the chapters on the English Fens and on Norway, Sweden, Denmark, and Iceland; and he was also good enough to undertake the writing of the chapters on Ireland. The chapters on Local Government, with the exception of the paragraphs on the county boundaries in England and Scotland, are by Mr. T. W. Arnold.

I am also indebted to Mr. H. N. Dickson, M.A., B.Sc.,

Oxon., for his kindness in reading and correcting the proofs of Chapter IX. (the Climate of Great Britain); to Prof. James Geikie, D.C.L., F.R.S., for reading those of Sections 1-3 in Chapter XI. (relating to the Ice Age and Palæolithic and Neolithic Man); to Mr. T. W. Shore, F.G.S., Hon. Organising Secretary to the Hampshire Field Club and Archæological Society, and Hon. Secretary to the London and Middlesex Archæological Society, for reading those of Chapter XII. (on Roman Britain); to Mr. Hubert Hall, F.S.A., of the Record Office, author of *The Customs Revenue of England*, for reading those of Chapter XX. (on the Foreign Commerce and Shipping of England, chiefly during the Middle Ages), and to Mr. G. Armitage-Smith, M.A., Principal of the Birkbeck Institution, and author of *The Free Trade Movement*, for reading those of Chapter XXII. (on the Nineteenth Century).

The maps have all been compiled under the supervision of Mr. John Bolton in Mr. Stanford's house.

The Publisher also desires to acknowledge his indebtedness to Godfrey Bingley, Esq., of Headingley, for the photograph of Ingleborough, reproduced on p. 87, and to Dr. T. Thoroddsen for the views in Iceland, originally published in the *Journal of the Royal Geographical Society*, and reproduced here from blocks kindly lent by that Society. The views of North Cape (p. 674), Seven Sisters' Fall (p. 676), Bergen (p. 686),

Trondhjem (pp. 687-688), and the group of Lapps (p. 694) are from the excellent series of Scandinavian photographs by Mr. Ellerbeck of Liverpool; those of Stockholm and Gothenburg are by Lindahls of Stockholm; that of Stonehenge, on p. 210, is by Mr. Percy Home of *The Sphere*; and those of High Tor, Matlock (p. 77), Striding Edge, Helvellyn (p. 81), and The Needles (p. 100) are by the Graphotone Company of Enfield. The Ancient Stone Implement on p. 202 is from Mr. Worthington G. Smith's *Man, The Primeval Savage*, published by Mr. Stanford.

GEO. G. CHISHOLM.

Sept. 29, 1902.

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EUROPE

CHAPTER I

BELGIUM

1. Relations to Surrounding Countries

BELGIUM is in a marked degree a country of transitions. Separated from none of the surrounding countries by any well-marked physical features, unless we note under this head the two unbridged portions of the Meuse which in Limburg now divide it from the kingdom of the Netherlands, it presents within a limited area¹ (about one-eighth of the extent of Great Britain) and within a very moderate range of elevation some marked contrasts of surface and geological structure, and all these it shares with one or other of the adjoining countries on the north, east, and south. Moreover, it is traversed by the dividing line between the Teutonic and Romance families of languages—a testimony to the fact that this region of transition, in respect of physical features, has been the scene of conflict between different races. His-

¹ Area, 11,373 sq. miles; population (1880), 5,520,000; (1890), 6,069,000, showing a mean rate of increase of 0·95 per cent per annum; (1900), 6,815,000, showing an average density of 599 to the sq. mile, and a mean rate of increase since the previous census of 1·17 per cent per annum.

torically the uncertain character of its geographical position has been borne out by changes in the political relations of the territory now composing the kingdom, though some of these changes (the early association with the German Empire and the recent connection with the kingdom of the Netherlands, as well as the cession of part of Flanders to France) may be regarded as directly illustrating its various geographical connections, while others, such as the union with Burgundy and the consequent annexations to the dominions of Austria and Spain, must rather be regarded as among the freaks and accidents of history.

2. Physical Features of Upper Belgium

The territory of Belgium slopes, on the whole, from south-east to north-west. The region lying to the south-east of the well-marked line of the Sambre and Meuse may be designated Upper Belgium, and is mainly composed of Devonian slates, which it shares with France, the grand-duchy of Luxemburg, and Prussia. Within historical times this region formed, except in its valleys, one vast forest—the *Forest of Ardennes*, of which extensive tracts still survive, and it is traversed by the heights of the Ardennes in a more restricted sense running right through the country from France into Rhenish Prussia. Though mainly of Devonian age, these heights within Belgian territory toward the eastern frontier are partly composed of ancient, non-fossiliferous, crystalline slates, and similar rocks form the bleak plateau of the Hohe Venn, which stretches from Belgium into Rhenish Prussia farther north. It is to this plateau that the highest altitude of Belgium belongs, namely, the *Baraque St. Michel* (2205 feet), on

the German frontier, close beside the road from Verviers to Malmedy. The surface of the slaty region is, for the most part, gently undulating, but north-west of the Ardennes proper there is a somewhat lower tract surmounted in places by blocks and ridges of limestone, which impart in places a picturesque aspect to the scene. Such is the district of the Famenne, east of the valley in which the Meuse breaks through Upper Belgium from the south, and still more that of the Fagne, west of that line. Farther north still, as in the Condroz between the Meuse and the Ourthe, sandstone ridges rise from a basis of limestone.

The line of the Sambre and Meuse is composed of a deep but narrow and steep-sided valley, which is typical of the valleys of Upper Belgium generally. Especially so is the portion belonging to the Sambre, with its continuous succession of loops intersecting the flat meadows forming the bottom of the valley. Such also are the valleys of the Sémoy, the Lesse, the Ourthe, the Amblève, and the Vesdre or Weser, all of which belong to the same basin. Some of them, such as the Ourthe, the Amblève, and the Vesdre, as well as the Meuse (throughout its course in Belgium) and the Sambre, are very important as marking the natural lines for roads and railways through these higher grounds, while, on the other hand, in the case of the Sémoy, the narrowness and tortuosity of the valley are carried to such an extreme as to make it rather an impediment than an aid to communication.

3. Middle Belgium

The line of the Sambre and Meuse is important not merely as a surface feature, but also geologically, inas-

much as the rocks on both sides form a narrow strip of Permian and Carboniferous deposits (with productive coal-measures), partly traversing and partly lying on the outer border of the more ancient Devonian rocks. The region lying immediately to the north-west is generally of lower elevation than that to the south-east, but as far as the Lys to the west and the Demer to the east of the Scheldt, has for the most part an elevation of 150 to 600 feet, and hence may be described as Middle Belgium. Here the prevailing slopes are towards the north and west. Only a narrow strip is drained south-eastwards to the Meuse, all the rest belonging to the basin of the Scheldt. The surface consists in the south-west partly of Devonian rocks, but is mainly composed of those of Tertiary age, associated, however, with Cretaceous deposits in the north-east. The soil in this part of Middle Belgium—that is, the tract between the Meuse and the Great Geete, known as the *Hesbaye* (west of the city of Liège)—is of exceptional fertility, and peculiarly adapted for the growth of wheat. It is composed of a light loam, rich in lime, resting on a firm basis of clay. Farther west, between the Great Geete and about the meridian of Brussels, the loamy soil is not so continuous, and the subsoil is mainly composed of dry sand, so that this tract is not so fertile; but still farther west clay forms the prevailing soil, which is adapted and utilised for a great variety of crops, including cereals, sugar-beet, hops, chicory, etc. Such is the character of the higher parts of Flanders, as well as the greater part of Hainaut.

4. Lower Belgium

The remainder of the country forms Lower Belgium, stretching along the sea between France and the Nether-



CONFLUENCE OF THE SAMBRE AND MEUSE AT NAMUR.

lands, and then all along the border of the latter kingdom, which it resembles in the character of its soil and surface at all the parts which it touches, comprising, like it, an area below the level of mean-tide. This area, about 280,000 acres or 440 square miles in extent, lies near the sea-coast and the western part of the Dutch frontier, and would be submerged at every tide if it were not protected by a line of sand-dunes, which is continued from France to the Netherlands all along the Belgian coast. Its length in Belgium is $41\frac{1}{2}$ miles, its greatest width (in the south-west, not far from Nieupoort) $7\frac{1}{2}$ -8 miles, its average height 50-80 feet, and its greatest height, in the extreme south-west, 115 feet. Only three openings in this line are maintained for the drainage of the region behind—at Nieupoort, Ostend, and Heyst; and the mouths of the streams which here find an outlet have to be artificially kept from silting up or being stopt up by the deposit carried by marine currents, and at high tide have to be closed by sluices against the sea. The whole area that has thus to be protected against submergence is divided by means of dykes or embankments into enclosures, called polders, which are artificially drained by steam-engines or wind-mills, the drainage water being pumped into canals running along the embankments and communicating with the rivers. The soil of this region is extremely fertile, but better adapted for pasture than for tillage, and hence the area is mainly devoted to cattle rearing.

An adjoining area on the east and south, of about 1350 square miles in extent, making up the greater part of the remainder of the lower parts of Flanders, is mostly covered with a sandy soil. This, however, rests in the south on a subsoil of clay, and in the north is overspread with a thin covering of loam, both rendering

the soil capable of improvement, so that by the industry of centuries this has been made one of the most fertile districts of Europe. From about one-fourth of the area two crops are reaped in the year, some corn crop being followed by clover or beet.

Then follows to the east a tract of about 1900 square miles in extent, composed mainly of sandy soil to a considerable depth, and hence forming the least fertile and populous region of Belgium. Like many other sandy areas, this soil is hardened in places by infiltrations, which cause the sand to cake and form a crust almost or quite impenetrable by the roots of plants. Here such incrustations are due to a hydrated oxide of iron. This area is what is known as the Campine, or, in Flemish and Dutch, Kempenland, and is, in fact, the westernmost part of the *geest*, which, besides making up the greater part of the Belgian provinces of Antwerp and Limburg, passes through Holland and lies behind the marshland of the north German plain from the Dutch frontier to the Elbe. In Belgium much of this land is still utterly waste, though reclamation has in recent years been actively carried on, and about one-fifth of the surface is covered with pine forests.

More than two-thirds of Middle and Lower Belgium is drained by the Scheldt and its tributaries, only small tracts being drained by the Yser direct to the sea, or in the east into the Meuse. All the rivers are sluggish, winding streams, well adapted for navigation or the supply of navigable canals, which in Western and Northern Belgium form important means of communication.

5. Minerals

Upper and Middle Belgium are remarkably rich in minerals, and above all, in coal. The situation of the *coal-fields* has already been roughly indicated, but some details are important and interesting. The Carboniferous area forms a strip of about 500 square miles in extent, occupying the valleys of the Meuse and Sambre from about Liège to Charleroi, and stretching thence westwards across the French frontier, and the chief coal-mining districts are in the neighbourhood of Liège, Namur, Charleroi (to the west of the Sambre), and Mons, the last district forming a somewhat detached area, drained by the Haine. The whole area has been very much disturbed and contorted. A great fault extends from Liège to Boulogne, and the rocks to the south-east of that line have been pushed over those to the north-west, so that in several places coal is mined under Devonian strata, and near Namur it is even found under those of Silurian age. These great movements have led to the formation of many minor faults in the coal-seams themselves, as well as to much folding of the seams, which thus have in many places an exceptionally high dipping angle. The seams, moreover, are not generally thick, mostly only from 2-3 feet, seldom more than 6 feet, and as their working has been carried on for centuries (in part since the thirteenth century) the mines are generally very deep. In 1894 the average thickness of the worked seams was 2·09 feet, and the depth of the mines 1400 feet. These conditions require the drainage works to be on an exceptionally large scale, and for all these reasons the working of coal in Belgium is generally difficult and expensive. Nevertheless, the

total amount of the production still tends to increase, and Belgium produces, notwithstanding its extensive metallurgic and textile industries, more coal than is required for its own wants, its annual export being about four times as great as its import of this commodity. The amount of coal produced in the country has increased from about 2,600,000 tons in 1835 to upwards of 20 million tons in recent years, the amount exported (chiefly to France) being rather more than one-fourth of the whole. The rate of increase of production is now very slow; but a new coal-field has been discovered at Lanaken in Limburg, near the Meuse, a little below the Dutch town of Maastricht, at a depth of about 1770 feet.

Next to coal the most important mineral product of Belgium is *iron ore*, which is obtained principally near Namur, partly to the north of that town, partly in the angle between the Sambre and the Meuse to the south. In this case, however, the Belgian production has greatly declined, and the iron industry of the country is now mainly dependent on ore brought from the grand-duchy of Luxemburg. The native production, after reaching 800,000 tons in 1860, declined to much less than a fourth of that between 1884 and 1890, though it has since somewhat risen.

Another important but declining mining industry of Belgium is that of *zinc*. Ores of this metal are found both in the form of zinc-blende and in that of calamine, both of them generally associated with iron pyrites, principally in the valley of the Meuse between Huy and Liège, and in that of the Vesdre east of Liège. After reaching a total of about 80,000 in 1850, the aggregate production of both these ores has sunk in recent years to about 12,000 tons. On the other hand, manganese

ore, after being feebly worked from 1880, suddenly rose into importance as an economic product in 1887.

6. People—Walloons and Flemings

The kingdom of Belgium has been artificially welded together out of two distinct elements, at least in respect of language, but how far this difference of language indicates a difference of origin has long been and still is a matter of dispute. The name of the kingdom proves nothing, for though it is of ancient origin there has been no continuity in its application. It was not in use in the Middle Ages, and was revived only in modern times. Moreover, it is not merely a matter of controversy whether the two linguistic elements of the present population, the Walloons of the south-east, speaking either French or a language essentially the same as French, and the inhabitants of the north-west, speaking a language essentially the same as Dutch, although distinguished by some peculiarities and known as Flemish, represent two originally distinct races, but also to what race the ancient Belgæ of Cæsar themselves belonged, whether Celtic or Teutonic. What is certain is that the prevalence of two languages in different regions of the territory now forming the kingdom of Belgium is a thing of old standing. It is likewise certain that the Walloon, like the French, is due to the ancient Roman influence which reached as far north as the mouth of the Rhine as that river flowed in ancient times.

Hence Walloon is by no means a corrupt French, although, since the political supremacy of the Burgundians, to a large extent displaced by that language. It shows greater affinity rather with the Romance of several Swiss cantons, and with the Tirolese Ladin or Rumonsh. In

some rural districts of Belgium the two elements are so blended together that a Walloon often adjoins a Flemish village, or else both are separated only by the intervening highway. For hundreds of years the two races have thus dwelt together, for hundreds of years they have lived through the same political vicissitudes, but to the present time no intimate union has taken place between them. This deep contrast between speech and national usages has outlived the Revolution of 1830, notwithstanding all their common institutions and interests, and the belief is very general that these interests and their common freedom are the only ties that hold them together. A line drawn from Dunkirk, south of Tournai, to Ath, and thence north to Tongern, will roughly divide the Belgian territory according to the two forms of speech prevailing in it, though, as is evident from what has been stated, there are isolated Walloon groups north of this line, as there are Flemish to the south-east of it. In Brussels both idioms meet on common ground, the upper town being decidedly French, the lower Flemish. French, however, is the official language of the country and of the Government, even though the capital, as shown on the accompanying map,¹ belongs to the Flemish portion of the country.

In order to form a correct estimate of the political and social situation in Belgium, it is necessary constantly to bear in mind the ethnical identity of the Flemings with the Dutch. At the Congress of Vienna the seeds of dissension were sown by comprising within the then constituted kingdom of the Netherlands the Walloon domain, instead of transferring it to France, to which it naturally belonged. The differences of habits, customs, and especially of religion, contained the germs of endless future discord. As almost everywhere else, here also the

¹ See map at p. 58, vol. i.

south was. Catholic, the north Protestant. To the former confession adhere both the Teutonic Flemings and the Celtic Walloons, and the kingdom of Belgium, as now constituted, is one of the most Catholic countries in the world. Hence the antagonism between north and south betrayed itself with the greatest bitterness, first of all in the Church, and then in the army and the States-General, resulting at last in the violent severance of Belgium from the Protestant Netherlands in 1830. But scarcely had the new kingdom been established when the national antipathies were again manifested. The Catholic clergy had no doubt skilfully availed themselves of the Walloons and French, out of whose ranks the most enlightened and energetic spirits had arisen. But once their independence was achieved they took a decided part with the Flemings, who now formed the majority, and who demanded that the new nationality should be based on their speech. In truth, but for the efforts of the lower clergy in previous times, Flemish would have long since sunk to the position of a mere patois. However, notwithstanding the attention they have since paid to their national literature, the Flemings have been hitherto unable either to set aside the French language in Belgium, which continues to be the idiom of all the upper classes, or yet to acquire the political position due to their numerical ascendancy.

Of all the European states, except the kingdom of Saxony, Belgium has the largest relative population. The region with the sparsest population is that lying to the south-east of the Sambre-Meuse and Vesdre valleys—that is, Upper Belgium, and it is there also, and in Limburg, that the rate of increase of population is lowest—lowest of all is the province of Luxemburg in the extreme south-east, where the density of population

is under 150 to the square mile. In the western provinces, East and West Flanders, and Hainaut (notwithstanding the productive coal-mining and active industries dependent thereon in the last-named province) the rate of increase of population is also considerably under the average for the whole kingdom, the highest rate being found in the provinces of Brabant, Antwerp, and



A BELGIAN MILK-CART.

Liège, and chiefly due to the rapid growth of the capital of the kingdom, the chief seaport, and the most prosperous industrial centre. From this account of the distribution of population it is clear that the population is denser in the region where Flemish is spoken than in that in which the Walloon element predominates, but it is equally obvious that this is due to physical conditions and not to ethnical and linguistic differences.

7. Chief Towns and Industries

In Roman times the present Belgian territory was of little importance, and yet when provinces now forming the west of Belgium did begin to rise into wealth and consequence they did so from an influence that has been operating from the earliest period of the commercial history of Europe, but one whose action has been variously modified by changes in physical as well as political conditions. The influence referred to is that of the great waterway of the Rhine, which has never ceased to be a great highway of commerce since its mouths first gave access to regions furnishing commercial commodities in the time of the ancient Etruscans. In Roman times, however, the chief towns affected by this waterway were confined to the river itself, the advantage of which was, moreover, much diminished by the fact of its being in its lower course a frontier stream, whose right bank was occupied by barbarians. Then the south-east of Belgium, including the valley of the Sambre-Meuse, appears to have been in Roman times too entirely a region of forest to have offered sites for towns. Hence, perhaps, the only place that can be named in Belgium which had any great importance in the early centuries of the Christian era is *Tongres* or *Tongern*, in the fertile Hesbaye, the city of the ancient Tongri. This was afterwards capital of the *Provincia Germania Secunda*, and it was seat of a bishop from an early period, but deprived of its rank soon after the foundation by one of its own bishops of the city of Liège, to which the bishopric was transferred in 720.

In Western Belgium the Flemish towns of *Bruges* and Ghent first came into prominence after a renewed stimulus had been given to commerce by the Crusades. By this

time great changes had taken place in the delta of the Rhine and Meuse, as is shown in the chapter on the Netherlands, and Flanders offered the only seaports in the vicinity of the region capable of maintaining a large population, and at the same time sufficiently near the mouth of the Rhine to profit by that waterway. Down to the latter part of the fifteenth century, and perhaps



BRUGES.

even later, a creek known as the Swyn or Zwin led from Kadzand, now in the Dutch province of Zeeland, by Sluis to Bruges, and of this the harbour of Sluis, enlarged and improved by Philip Cornet of Flanders in 1311, formed an expansion stretching from Sluis to Damme. With this harbour Ghent also was in communication by canals if not, as some think possible, by the Lys itself, which then may have entered the Zwin instead of turning eastward to the Scheldt. The utilisation of these advantages for commerce served likewise as a stimulus for agriculture

and manufacturing industry. Then the flax of the Lys, which still furnishes the best of all materials for linen, began to be spun and woven for a wider and wider market, and then, too, English wool began to be woven in Flanders into garments for "all the world." Bruges, a great Hanseatic factory from the thirteenth century, was frequently the staple for English wool in the four-



THE GOLDEN GATE, BRUGES.

teenth century, down to the time when about the end of that century the staple was permanently fixed at Calais; and both Bruges and Ghent continued to be flourishing manufacturing towns, without rivals in Northern Europe, down to the time of the wars under Philip II. Throughout that period agriculture and the arts continued to advance more rapidly in Flanders and Brabant than anywhere else, so that these provinces became the instructors of England in nearly all branches of industry. As late as 1468, 150 merchant vessels are recorded to

have entered the port of Bruges at one time. Gradually, however, the Zwin got silted up, all the more rapidly in all likelihood in consequence of neglect in time of civil war and the consequent disorganisation of industry. Bruges, though still noted for its tapestries in the time of Colbert, decayed, and it has never revived. It was connected by canal with Ostend in 1736, and again with the sea by way of Sluis in 1817; but meantime sea-going vessels had become larger, and these canals could hardly restore to the town the rank of a seaport, and by no means that of a leading seaport. Bruges accordingly, which at the height of its prosperity is estimated to have had a population of 200,000, has sunk to one of less than 50,000, and since 1846 it has been stationary or declining. At that date its population was 49,300, in 1880 it had sunk to 44,500, but in 1900 it had risen to 53,000. Now, however, a bolder attempt to revivify it has been made. In 1900 Bruges was brought, by means of a ship-canal with a depth of 26 feet 3 inches, and a bottom width of $72\frac{1}{2}$ feet, into connection with Heyst or Zeebrügge, which is to be made an outpost of Bruges, with a harbour capable of receiving at one time twenty-one of the largest Atlantic liners.

Ghent (Gand), at the confluence of the Lys and Scheldt, has succeeded in maintaining a more important position among Belgian towns, partly no doubt in consequence of the navigation of these two rivers, which serve as waterways in three directions, the Scheldt here changing its course from north-east to east. Here also considerable physical changes have taken place. In the Middle Ages the site of Ghent was threaded by an intricate network of channels connected with the two rivers just named; but though at all periods of history there seems to have been some connection between these two

rivers at this point, the Lys, down to about the thirteenth century, was more properly to be regarded as the head-stream of the Durme (now an independent tributary of the Scheldt entering the main stream from the west above Tamise), and the Lys-Durme then entered the Hont or Hontee or West Scheldt by several deltaic arms, more than one of which was navigable. One of



GHENT.

these flowed nearly due north from Ghent by Ertvelde and Assenede, and entered the Hont by the wide creek known as the Braakman, but the most important was that which passed by Sas van Ghent to Terneuzen in Zeeland.¹ In 1180 it became the capital of Flanders,

¹ See Van Werneke, "Le Cours de l'Escaut et de la Lys-Durme au moyen age," in *Bull. de la Société belge de Géogr.* vol. xvi. (1892) pp. 453-85, 588-611.

and in the beginning of the fourteenth century is said to have had 40,000 workers in woollens and linens. Linen manufactures it still retains, but the former woollens have been replaced by cottons (now the leading industry). The old waterway from Terneuzen has long been canalised, and since 1886 this canal has been large enough to admit vessels of 2500 tons burden, $17\frac{1}{2}$ feet draught. It is also connected by way of Bruges with Ostend by a canal of a minimum depth of 7 feet. By means of works expected to be completed by the spring of 1905, the Terneuzen-Ghent waterway is to be made available for vessels drawing about 26 feet, so as to afford increased facilities for the growing traffic, more particularly the export of sugar and beet to Great Britain and the import thence of coal. The population of the town has steadily increased from 103,000 at the end of 1846 to 161,000 at the end of 1900 (exclusive of its suburbs of Ledeborg and Mont St. Amand, which may bring up the total population to about 180,000).

Bruges and Ghent, at the height of their prosperity, had a rival in a third seaport, *Ypres* or in Flemish *Yperen*, now farther inland than either, and with a much inferior communication with the sea, the waterway formed partly by the Yser and partly by a canal connecting it with the insignificant port of Nieupoort, having a minimum depth of only $3\frac{3}{4}$ feet. In the thirteenth and fourteenth centuries flourishing woollen and linen manufactures were carried on here also, and the population is estimated to have reached 200,000; but though the linen industry still lingers on, the town languishes, its population (in 1890, 16,500) having diminished by several hundreds since 1846. Not far off is another town long celebrated for its linen manufactures, *Courtrai*, in Flemish *Kortrijk*, on the Lys,

situated like Ypres at the base of the hill country of Flanders, but enjoying the advantage of better navigation, that river forming a waterway with a minimum depth of 7 feet, communicating not only with Ghent and through it with Antwerp and Terneuzen, but also with the canal system of Northern France. These advantages



HOTEL DE VILLE, COURTRAI.

no doubt help to explain the growth of its population by upwards of 50 per cent between 1846 and 1890, at which latter date it numbered about 34,000. But a still more important circumstance contributing to the prosperity of the town consists in the fact that the waters of the Lys above Courtrai are peculiarly suited for the retting of flax, the fibre of which here acquires remarkable fineness combined with extreme tenacity. On this portion of the river from 12,000 to 15,000 labourers are employed during the retting season (April to October), and Courtrai is the centre



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of the trade, and also carries on a considerable industry in spinning and weaving, though the fibre that is here spun is not, strange to say, the fine fibre of the district, but the coarser fibre of Russia.¹ *Tournai*,² in Flemish *Doornik*, on the Scheldt, to the south-east of Courtrai, is another manufacturing town, worthy of note as having been already mentioned in the first half of the fifth century as one of the Roman towns in the Carbonarian Forest, that part of the forest of Ardennes which lay between the Meuse and the Scheldt.

All the older Flemish ports have, for the time at least, been completely outstript by the modern port of *Ostend* (Ostende), which has acquired importance since the establishment of lines of steamers in connection with the neighbouring ports of England. Besides a tidal harbour, it has docks with a depth of 18 feet, and works have been begun with the view of greatly extending its docks at a cost of about £3,000,000. Its population increased from about 14,000 in 1846 to upwards of 24,000 at the end of 1890, and during the summer the population is greatly increased by the crowd of sea-bathing visitors attracted by the long stretch of smooth sand.

But all Flemish ports have for centuries been insignificant in comparison with the Brabant port of *Antwerp*, in French *Anvers*, at the head of the estuary of the Scheldt. Looking at the present configuration of land and water, and the soundings of that estuary, one sees that it could not now be otherwise, and what requires explanation is rather the fact that this city was so late in starting into rivalry with the ports of Flanders. The place "at the wharf," or rather ship-

¹ See *Foreign Office Report*, Misc. Ser. No. 519.

² Pop. (1900), 31,000.

building yard (*aen't werf*), is indeed mentioned as far back as 646, but it was long in rising into prominence. Not only did the Flemish ports then enjoy advantages which they no longer possess, but the neighbourhood of Antwerp suffered from the disadvantage of being occupied by extensive marshes, which were only slowly



OSTEND.

reclaimed. This in itself would retard the growth of the inland cities of Brabant, and Antwerp, Brussels, and Louvain all grew up together. It was not till about the end of the fourteenth century, however, that Antwerp appeared as a rival of Bruges, and as Bruges was in a large measure identified with the English staple and the trade in English raw wool, the rise of Antwerp was to a considerable extent associated with that of the merchant

adventurers of England and their trade in woollen manufactures. We may accordingly take the year 1406 or 1407, in which that corporation acquired a house in Antwerp, as an important fixed point in the beginning of its commercial history. Since then it has gradually risen to a leading place among the seaports of Northern Europe, but its position with respect to its Dutch rivals of Rotterdam and Amsterdam has been affected now by political and now by physical and economic conditions. In former days it reached the height of its prosperity in the sixteenth century, when the great extent of its commerce was recorded by Guicciardini in his *Description of the Netherlands* (1560). Like the other ports of the Southern Netherlands it suffered by the revolt of the northern provinces against Philip II. in 1579, since Zealand, which joined those provinces, commanded the mouths of the Scheldt, and their right to keep these mouths closed was secured to them at the Peace of Westphalia in 1648. Not till the period of French rule after the French revolution was this barrier removed, but under French domination and during the period of union with the Netherlands (1814-1830), the rapid rise of the port indicated the great importance of its natural advantages. Again its rise was checked by the separation of the Belgian provinces from those which still form the kingdom of the Netherlands, for this kingdom then reimposed a toll at the mouths¹ of the Scheldt which subsisted till 1863. Only since then has the navigation from Antwerp to the sea been free from foreign imposts. About the same time there were carried out great harbour works, to make room for which the old fortifications were levelled in 1859, and since then the commerce of the port, which is only 46

¹ See under Netherlands, Rivers, p. 40.



ANTWERP.

miles from the sea, has risen with striking and uninterrupted rapidity, as is shown by the following table, giving in thousands of tons the tonnage of sea-going vessels entered at different dates since 1833 :—

Year.	Tonnage.	Year.	Tonnage.	Year.	Tonnage.
1830	120	1860	546	1890	4499
1840	179	1870	1363	1900	6680
1850	239	1880	3064	...	...

The decisive advantage of the port lies, as in the Thames, in the high tides which help to maintain a deep channel in the estuary, and thus enable vessels of large burden to ascend so far into the interior. The depth alongside some of the quays at low water is as much as 28·4 feet, and at high water 42 feet. Now that economy of transport demands in so many cases the use of vessels of immense size this is an advantage of increasing importance. But Antwerp also has the advantage of a rich mining and manufacturing hinterland within the country to which it belongs, and this fact has greatly contributed to the maintenance of a successful rivalry with the Dutch port of Rotterdam (see, however, below, pp. 65-6). The population of Antwerp increased from 88,000 at the end of 1846, to 117,000 at the end of 1866, and 286,000 at the end of 1900.

Of the inland towns of Brabant, *Brussels* and *Louvain* are those of most historical renown, both of them having been important manufacturing towns at least as early as the fourteenth century, and both of them at an early date seats of administration. Brussels lies on the margin of the hill country of Middle Belgium due south of Antwerp, and about midway between that port and the valley of the Sambre. The original nucleus of the city was an island in the small river Senne, the two arms of which enclosing the island are now concealed by the



BRUSSELS : THE HOTEL DE VILLE.

inner boulevards, but a suburb afterwards arose on the higher ground to the east, so that the escarpment of the hill country running through the city from south to north (St. Gilles to Schaerbeck) divides it into an upper and lower city. The first mention of Brussels belongs to the close of the sixth century. Before the close of the tenth century a castle was built here by the Duke of Lorraine, to whom it then belonged, and to whom the city owes its patron saint, St. Gudule, whose remains were brought thither by him in 980. The church¹ dedicated to this saint dates from 1273. About a hundred years later the city was surrounded by its first fortifications (1357-79), the lines of which are approximately marked by the present (outer) boulevards. Brussels first rose to its dominant position under the Duke of Burgundy, by whom, as well as by their Spanish and Austrian successors, it was made the seat of administration of the Netherlands, as since 1830 it has been the capital of the kingdom. It is to the influence of the Burgundian family that the upper town, which has always formed the residence of the wealthier classes, owes the use of the French language, the lower town, which is the commercial part of the city, having always remained Flemish in speech and characteristics. Though an inland town its outskirts are accessible by the canalised Senne to vessels drawing about 6 feet, but one of the projects at present entertained is one to enable vessels of 2000 tons' burden to reach the city. Brussels is often termed "The Little Paris," a designation which is to some extent justified by its sumptuous buildings, its boulevards, and its suburban Forest of Soigne, which is much finer and more extensive than the Bois de Boulogne. As capital of the country it has shared in the prosperity not only

¹ Often erroneously called a cathedral, which it never was.

of its port but also of the industrial towns of the south-east, but the growth of its population is not adequately represented by that within the city limits. The city population increased from 124,000 at the end of 1846 to 176,000 at the end of 1890, and in 1900 the population of city and suburbs amounted to 562,000.

Louvain,¹ which stands on the Dyle, and is connected



LOUVAIN.

by a canal admitting vessels of about 10 feet draught with the Ruppel, and this with Antwerp, was in early times of even greater importance than Brussels. At the end of the tenth century it was the capital of the counts of Louvain, afterward dukes of Brabant, and at the beginning of the fourteenth century it was estimated to have a population of 100,000, including 30,000 or 40,000 weavers, besides tanners, skilled armourers, and other artizans; but internal dissensions led to the migra-

¹ Pop. (1900), 42,000.

tion of large numbers of the working population and the consequent decay of the town, which was further accelerated by a plague. The university, which in the sixteenth century, when it numbered among its professors the celebrated anatomist Vesalius and Adrian of Utrecht, afterwards Pope Adrian VI., and among its students Erasmus and the Emperor Charles V., who had been placed under the tuition of Adrian, was the most famous in Europe, was founded in 1426 on the ruins of the former cloth market.

Of the towns of the basin of the Meuse *Liège*, in Flemish *Luik*, early acquired, and has always since retained, the first place in rank and population. Situated at the point where the road from the north German plain by way of Cologne and Aix-la-Chapelle enters the narrower part of the valley of the Meuse, in a position accordingly where there is still free communication with the plains to the north and north-west,—in a position, moreover, where the convergence of the valleys of the Vesdre from the east and the Ourthe from the south bring traffic from both these directions through Upper Belgium,—it could not fail to become an important centre of trade, to which manufacturing industry was naturally joined at an early date. A chapel was founded on its site in 558 by the Bishop of Tongres, and in 720 the town had already become a place of such importance that the bishopric was transferred thither. About the end of the tenth century the bishops established a strong temporal dominion, which lasted throughout the Middle Ages, though frequently at strife with a popular party. In modern times its importance has been confirmed and increased by the wealth of coal and iron in the neighbourhood, and though now dependent for most of its iron ore on supplies from the grand-duchy of Luxemburg, it is

still one of the most important seats of the iron industry on the continent, and specially noted for the manufacture of firearms, in which it has no rival. Its population increased from 76,000 at the end of 1846 to nearly 175,000 at the end of 1900, but this is only the central portion of an urban population extending for 7 or 8 miles up and down the valley of the Meuse from



LIÈGE.

Seraing above Liège to Herstal below the city, all largely, if not mainly, dependent on the iron industry in some form or other, and amounting at the end of 1890 to upwards of quarter of a million. At *Seraing*¹ are the celebrated Cockerill coal-mining and iron-works, founded in 1817 by two Englishmen of that name, and noted for having made the first locomotive on the continent (1835).

To the east of Liège on the Vesdre stands *Verviers*,² a

¹ Pop. (1900), 40,000.

² Pop. (1900), excluding suburbs, 52,000.

town celebrated for its woollen industry at least as far back as 1432, and still producing as fine woollen cloth as is made anywhere. It exports also large quantities of woollen yarn (even to England) and washed wool, the water of the Gileppe, which supplies power to many of its factories, being peculiarly well adapted for wool-washing on account of its purity, and especially its freedom from lime. To preserve this property a dam



HUY.

has been erected across the stream a few miles above the town, just above the point where it enters a limestone district.

On the Meuse above Liège the confluence of two small streams, one from the north and one from the south, whose valleys mark out the route for a road and a railway through the Hesbaye and the Condroz respectively, has been, since at least the tenth century, the seat of the town of *Huy*, another town engaged in

metallurgy, including zinc and tin-plate manufacture. Still higher the more important confluence of the Meuse and Sambre is marked by the town of *Namur*,¹ in Flemish *Namen*. It also is a seat of coal-mining and iron-working, but during the last fifty years has been only slowly progressive. Much more rapid has been the growth of the coal-mining town of *Charleroi*, higher up the Sambre, where the population has grown from less than 8000 at the end of 1846 to about 25,000, to which should be added other 25,000 for the suburbs of Châtelet and Châtelineau. *Mons*, Flemish *Berghen*, the chief town of the Borinage, as the great coal, iron, and glass-working district in the south of Hainaut is called, has a population about the same as that of Charleroi.

¹ Pop. (1900), 32,000.

CHAPTER II

NETHERLANDS

1. General Character of the Country

THE kingdom of the Netherlands¹ consists of the low grounds to the north of Belgium and west of Germany (Prussia). Much of its surface is made up of the deltaic deposits of the Rhine, Maas, and Scheldt, and a considerable portion of this tract, and some others elsewhere, are below the level of the sea. Its present form is the result of a struggle still going on between the hands of man and the forces of nature—a struggle that leaves the victory sometimes on the one side and sometimes on the other, although since the fifteenth century man has for the most part been victorious. In Roman times, however, the area of land in this territory was perhaps larger than it is now. Then at least the large indentation on the north, known as the Zuider Zee or South Sea, so called in contradistinction to the North Sea outside of the string of islands which form the extreme north of the country, did not exist. It was represented only by

¹ Area 12,648 sq. miles; pop. (Dec. 31, 1879), 4,013,000; (1889), 4,549,000, showing a mean rate of increase of 1·26 per cent per annum; (1899), 5,104,000, showing an average density of 403 per sq. mile; and again a mean rate of increase since the previous census of 1·26 per cent per annum.

a comparatively small inland lake, known as Flevo, a name replaced in the Middle Ages by that of Almaro. Inroads of the sea were, however, made at various dates. In 1170, 1237, 1250, and 1287 the sea broke through the channels or gats (gates) on the north, and finally, towards the end of the fourteenth century (1395), the sea broke the barrier between Enkhuizen and Stavoren, and reaching the ancient Flevo enlarged its borders to about its present limits. The sea thus formed is of little depth—at most 50 feet, and of the channels that connect it with the North Sea the Marsdiep, $2\frac{1}{2}$ miles wide, between the mainland and the island of Texel, and the Vliestrom, 6 miles wide, between Vlieland and Terschelling, are the only two deep enough (both about 65 feet) to have sensible tides and to be capable of navigation by large vessels. The others are nearly blocked by sand or mud-banks, and the islands have on their inner side large mud-banks (*wadden*), exposed at low tide, connecting them with the mainland.

The Lauwerszee or Groningerdiep, between the provinces of Groningen and Friesland, was formed at an even earlier date. The first inroad seems to have taken place about the ninth century, but it was subsequently enlarged on several occasions. A larger inundation from the Ems in 1277 formed the Dollart, and in 1421 the Biesbosch,¹ which is now composed of a large number of islands, to a large extent covered with coarse grass, between the arms of the Maas, was the result of a great inundation, known as St. Elizabeth's flood from its happening on that saint's day (18th November). Both these last catastrophes are partly ascribed to the neglect of artificial embankments in times of internal strife and disorder. By the latter an

¹ "Thicket of bent."

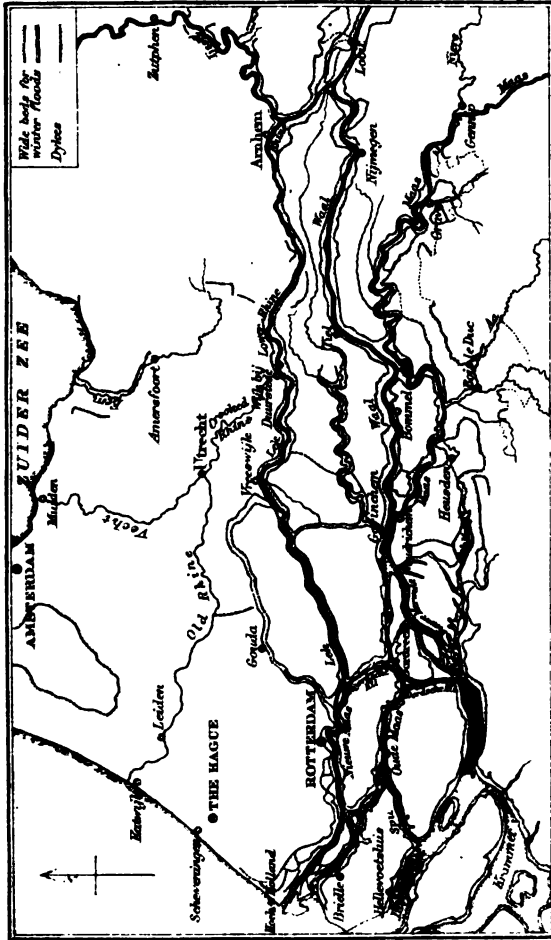
area of 180 square miles was submerged, 72 villages destroyed, and about 100,000 people drowned.

2. Rivers

From the account just given it is apparent that it is not merely the sea that the Dutch have to defend themselves against. As in other deltaic tracts, the rivers in their unregulated condition have shifted their course repeatedly. It would be incorrect to say that they have wandered at will over the surface, though that is the first idea suggested. The truth rather is that they have been driven from side to side through the result of their own action. Their own deposits, whether during their normal flow or during flood, have gradually raised their beds and their banks until it was easier in some gush of high water to plunge from some weak point of the bank over a new course than to continue in the established bed. And this must happen endlessly till man interferes. But from a very early date in the Netherlands man has interfered. The great rivers are all regulated; but though they accept control, they demand respect. Some latitude must be allowed them. Only on that condition will they keep their appointed courses. In summer they require no restraint, but wide beds must be left them for their winter floods, as shown on the accompanying diagram.

Every year the rivers of the Netherlands are estimated to carry down, on the average, about 530 millions of cubic feet, equal to an area of more than 1200 acres, or nearly 2 square miles, 1 foot in thickness, and of this quantity the Rhine naturally contributes from its basin, nearly equal to the area of Great Britain, and nearly seven times as large as that of the Maas, by far the

THE LOWER COURSES OF THE RHINE & MAAS



Stanford's Geog. Ensl. London.

London: Edward Stanford, 12, 13 & 14, Long Acre, W.C.

SECTION OF ONE OF THE GREAT DUTCH RIVERS



- A. Summer bed
- B. Inner banks, usually overgrown with reeds
- C. Summer dykes
- D. Outer banks
- E. Great dykes limiting flood bed of river

largest share. The quantity of water which it introduces into the Netherlands at Lobit is equal, on the average, to about 83,000 cubic feet per second. This river, accordingly, is most subject to change, and most in need of control, and above all in its lower course, where it mingles its waters with those of the Maas.

Evidence of changes in its course, due partly to natural causes, partly to the interference of man, is found in old names. The Neder Rijn, or Lower Rhine, is no longer the Lower Rhine in any true sense of the term. At Pannerden, just below the point where it enters wholly within Netherlandish territory, fully seven-tenths of its water flows on under the name of the Waal, and the smaller share is carried onwards under the name of the Neder Rijn by an artificial cutting dug in 1701-07. A dead arm communicating with this branch of the Rhine is known as the Oude Rijn or Old Rhine. A few miles below the Neder Rijn gives off one-third of its water to a branch flowing northwards under the name of the IJssel by Zutphen to the Zuider Zee, leaving less than one-fifth of the original Rhine to continue its westerly course past Arnhem as the Neder Rijn. Some 30 miles farther on another change in name takes place. At Wijk bij Duurstede a small fraction of its water winds north-westwards to Utrecht as the Kromme Rijn or Crooked Rhine, while the great bulk of the stream flows onwards as the Lek, and a few miles above Rotterdam rejoins the main body of the river, no longer, however, called the Waal, as at Pannerden, but the Nieuwe Maas. From Utrecht to Leiden and the sea at Katwijk a channel of water bears again the name of Oude Rijn, but there is only this name left to show that at one time the river actually entered the sea at this point. The channel now so called is no longer a stream,

but is broken up by dams into a number of stagnant sections. The damming of the Kromme Rijn at Wijk bij Duurstede took place even before the twelfth century, to prevent the silting up of the river mouth at Katwijk.

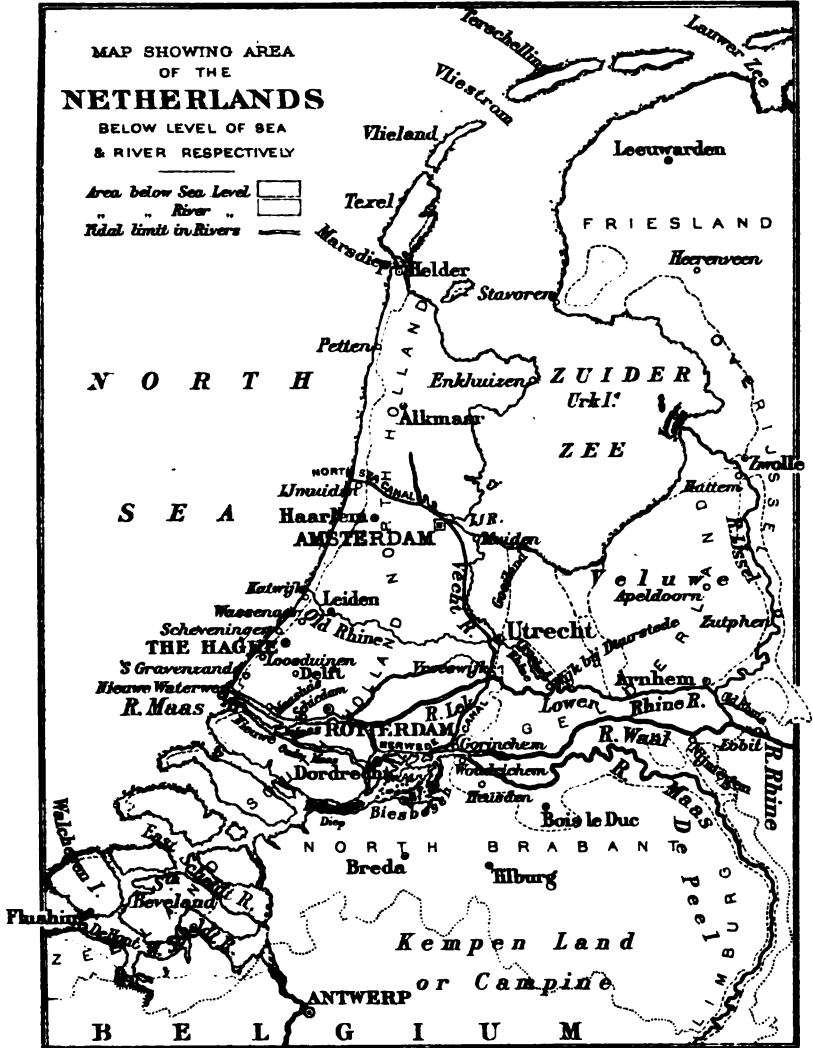
Equally misleading, if we look to present conditions, but equally interesting, if we consider historical changes, are the names of the Lower Maas and the arms communicating with it. If we wished to pay respect to facts as they are now, we should say that the Maas joins the Rhine (Waal) at Woudrichem above Gorinchem, and that thereafter the Rhine again divides into several branches. But history and custom have established that at this point the name of the united stream is changed to the Merwede, apparently after a village overwhelmed and swept out of existence by the great St. Elizabeth flood of 1421. The first branch of this stream goes off on the left as the Nieuwe (New) Merwede, and enters the Hollandsch Diep. The main stream pursues its course westwards to Dordrecht, and there again divides, the arm that continues the general direction of the river bearing, to one's surprise, once more the name of Maas (Oude Maas), while the other branch going northwards as the Noordsche Kil (North Channel) receives at its northern end the Lek (as we have seen, the right arm of the Rhine), and then flows onwards past Rotterdam as the Nieuwe Maas, the present mouth of which, the Nieuwe Waterweg or New Waterway, a little to the north of the old mouth, is artificial.

This intermingling of the waters of the Rhine and Maas causes special difficulties in their management. First, an overflow bed has to be left for the Maas in time of flood. This is done by means of an overflow outlet (*overlat*) on the left bank of the river to the south of Nijmegen, whereby a large tract of North Brabant is

MAP SHOWING AREA OF THE NETHERLANDS

BELOW LEVEL OF SEA
& RIVER RESPECTIVELY

Area below Sea Level 
" " River 
Tidal limit in Rivers 



Scale of Miles
0 10 20 30

Stanford's Geograph. Estab. London

London: Edward Stanford, 12, 13 & 14, Long Acre, W.C.

flooded in spring. This flood-water rejoins the Maas at a point on the south side of the Bommelerwaard—that is, the large peninsular tract between Waal and Maas above their confluence and below the point (at Fort St. Andries) where they approach within a mile of each other. But, secondly, an escape has to be allowed for the waters of the Waal when, as they sometimes do, they stand at a higher level than those of the Maas. To equalise the level an overflow is provided from the Rhine to the Maas above the Bommelerwaard. But that is only a partial remedy. The current at the mouth of the Maas still flows upwards in some cases in consequence of the water of the Waal at the confluence being at a higher level, and therefore another overflow outlet on the south side of the Bommelerwaard above Heusden allows the surplus waters of the Maas to enter the Hollandsch Diep by the channel of the Oude Maasje (Old Little Maas).

To obviate the inconveniences and avert the threatened dangers arising from this state of matters, a scheme for turning the whole stream of the Maas directly into the Hollandsch Diep by a cutting at Heusden was adopted by the Dutch legislature in 1883, but the works now in progress with a view to carrying out this scheme will still require some years for completion.¹

Besides the mouths of the Rhine and Meuse this kingdom has also that of the Scheldt. Originally the sole navigable mouth of this river was that which passed northwards between the island of South Beveland and the mainland, and then seawards by the channel known as the East Scheldt. In the Middle Ages this mouth was known simply as the Scheldt, and down to the early part of the fifteenth century the connection between it and the long inlet to the south of South Beveland and

¹ See *The Engineer* of 2nd March, 1900.

Walcheren islands, now known as the West Scheldt, but then only as the Hont,¹ Hontee ("river Hont"), or Heidenzee, was so shallow as not to be navigable. But about the date mentioned changes were wrought in the channels by floods, which made the outlet by the Hont navigable by the largest vessels then in use, and further inundations (1530, 1574-83), which greatly widened the old channel on the east of South Beveland, told still further in favour of the southern route.² At last in 1867 the northern route was completely closed by a railway embankment joining South Beveland to the mainland, so that this latter channel, the West Scheldt, now forms the only approach to the harbour of Antwerp.

The height to which the great rivers of the Netherlands are raised above the general surface of the country causes an extensive percolation of water through pervious beds to the adjoining land. Even where the overlying beds are an impervious clay there are generally permeable beds beneath through which the river water may pass, and in many places this water comes to the surface again in the form of springs, which are often a hindrance to cultivation.

3. Structure of Surface

In the surface of the Netherlands all the great geological eras are represented, but by far the greater part of the area, all except some small fraction chiefly in the southern outlying part of the province of Limburg, belongs to the Quaternary group. The members of this group are partly composed of diluvium, partly of alluvium. The diluvium is made up of the older sediments, partly dating from the time of the Ice Age. It consists of

¹ A name still in use.

² Van Werneke, *ubi supra*, pp. 459-63.

ZEE LAND

REFERENCE

Land enclosed by dykes
before 1200

.. between 1200 1400

.. gained after 1400

.. lost after 1200

Present Coastline

N O R T H

S E A

WALCHEREN



F L A

Scale of Miles

0 5 10 20

London: Ed

4

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deposits of pebbles, sand, loam, and clay, corresponding for the most part to the *geest* of Belgium and north-west Germany, and occupying the east and south-east of the kingdom. It comprises most of the higher ground of the country, though only at an elevation of from 30 to 400 feet (at St. Pietersberg near Maastricht) above the zero of the Amsterdam Pegel (water-gauge). Altogether it covers about 41 per cent of the whole surface. It is divided into three sections—Scandinavian diluvium in the north, Mixed diluvium in the middle, and Rhine and Maas diluvium in the south. The Scandinavian diluvium extends from the parallel of the town of Groningen in the north southwards to the Vecht, and lies mainly to the east of the meridian of 6° E., so that it embraces almost the whole of the province of Drente, with adjoining parts of the provinces of Groningen, Friesland, and Overijssel. Its centre is the small plateau of Ellertsveld in the middle of the province of Drente, with the Drente Hills (Drentsche Heuvels) in the south-east and the Hondsrug (Dog's back) in the north. On the margin of this plateau are the Hunebedden or graves of the earliest inhabitants of the country. The surface of the Scandinavian diluvium is partly composed of erratic blocks and pebble-beds, remains of ancient moraines of Scandinavian granite and gneiss, and partly of sand and loam derived from the decomposition of those rocks.

The Mixed Diluvium is partly of Scandinavian origin and partly made up of deposits brought from the east and south. It occupies the greater part of the area south of the Vecht and the Zuider Zee, and north of the Prussian frontier and the Maas valley, extending westwards to the neighbourhood of Utrecht and Muiden, thus embracing nearly the whole of Gelderland with the greater part of Overijssel and the eastern portion of the

province of Utrecht. The whole is divided into two sections by the meridional valley of the Gelderland Ijssel, the eastern section comprising the Achterhoek (that is, the hind-loop) of Gelderland and districts known as the *Twente*¹ and the *Salland*² in Overijssel, and the western the *Veluwe*³ in the same province, the *Gooiland*, a narrow strip noted for its fine views near the southern margin of the Zuider Zee and the Utrecht diluvium. The surface is composed partly of hills and pebble-ridges, in places well-wooded, as between Almelo and Hengelo in Overijssel and in Utrecht. The Veluwe is largely composed of sand, which is here and there ridged up into hills.

The Rhine and Maas diluvium is spread over almost the whole of the provinces of North Brabant and Limburg, the principal exceptions being the narrow meridional portion of the valley of the Maas, and a broader margin on the north bordering the Maas and Scheldt. It embraces extensive sand areas, and the southern portion of North Brabant, the Kempen or Campine, exactly resembles the Campine of Belgium, and thus includes considerable stretches of heath and blown sand. The surface deposits of the Rhine and Maas diluvium are mainly derived from the clay-slate plateau of south-eastern Belgium and western Prussia. In the southern expansion of Limburg the older diluvial beds are covered by a loess-like deposit, such as is found in many parts of Europe as well as in other parts of the world (above all in Northern China), a deposit of remarkable fertility, well adapted for the cultivation of cereals, and the source of the wellbeing and dense population of this part of the kingdom.

The alluvium of the Netherlands covers about 59

¹ = Tweede, "secondl."

² "Land on the Sala" or Ijssel.

³ = Vale ouwe, "unfruitful land."

per cent of the surface, and is mainly at an elevation of less than 30 feet above the zero of the Amsterdam Pegel, a considerable area even below that level. According to the character of the surface deposits, it is divided into sea-clay, river-clay, brook-sediments, and blown sand, including sand-dunes.

The sea-clay is composed of deposits originally brought down by the great rivers that have their mouths in the Netherlands, but first laid down in the sea, and afterwards converted into dry land partly by artificial means. It lies chiefly near the outer margin of the land, but within the strip of sand-dunes and blown sand which forms the outer coast-line from the frontier of Belgium to the last of the Frisian islands, though broken by the wide river mouths and the channels between the islands. It has a considerable extent in Groningen, Friesland (the north and west), and North Holland, but spreads farthest inland in the south-west of the country, where it occupies nearly the whole of the province of Zeeland, together with the insular and estuarine parts of North Brabant and South Holland, and forms some of the best soil in the Netherlands.

The river-clay has been deposited by the great rivers along their banks, and is distinguished from the sea-clay, in which only marine shells are found, by the presence of remains of fresh-water snails. Formerly these deposits were annually spread over a wide area on both banks of the rivers, and they now occupy in the region traversed by the Rhine, Lek, Waal, and Maas a tract 70 miles in length (Rotterdam to the east frontier), and with a width varying from about 7 miles (between Arnhem and Nijmegen) to 25 miles (Utrecht to Heusden). Now that the great rivers are all embanked,

the annual inundations and deposits of new silt are confined to the strips between the summer bed of the rivers and the embankments, the strips known as the *uiterwaarden*. Like the sea-clay, the river-clay is extremely fruitful, producing, besides cereals, hops, rape-seed, flax, hemp, tobacco, sugar-beet, and all kinds of vegetables and fruit suitable to the climate. In these last products the *Betuwe*,¹ or tract between the Rhine and Waal, is peculiarly rich.

The brook-sediments (*beekbezinkingen* or *groengronden*) are the deposits on the banks of the smaller rivers, chiefly in the diluvial area of the kingdom. They are of similar origin and composition to the sea- and river-clays, but are collected from smaller areas, and are less fertile. Usually they contain much iron-ore, which seems to have been worked at a very early date, signs of which are still to be seen in ancient heaps of slag, especially on the Veluwe in Western Gelderland, between Apeldoorn and Hattem. The ore, which yields an iron suitable only for cheap cast-iron wares, was till recently not only smelted for this purpose to a considerable extent in the Netherlands, but was also exported to Germany and Belgium. Its working seems now, however, to have ceased.

4. The Fens

The fens of the Netherlands are divided into low fens and high fens. The low fens have been formed in morasses and stagnant waters by the rotting of fresh-water plants under the water and out of reach of the rays of the sun. A spongy mass is gradually formed, and as it is lighter than water, it is bound in course of time to get detached and float on the surface. Such a

¹ = *bet ouwe*, "good land."

floating mass is known as *til* or *drift-til* (*drijftil*), and is liable to be blown about by the wind, or, in violent storms, such as in the past have from time to time caused breaches in the dykes, to be carried entirely away. Thus the waters of the Dollart, the Lauwerszee, the Zuider Zee, and the Biesbosch now occupy extensive tracts once covered with fens and *til*. The low fens generally rest on clay or sand. If the basis is clay,



TYPICAL POLDER SCENERY, ZAANDAM.

then the cost of clearing away the floating turf and draining the stagnant water by steam-engines or wind-mills may be repaid by the value of the land thus reclaimed, but if the basis is sand the loss entailed by such operations is apt to be considerable. Reclaimed low fens are known in the Netherlands as *droogmakerijen*. The land thus utilised is specially adapted for meadows and pastures, and it is chiefly to these operations that the province of North Holland owes its enormous cattle-rearing industry. In South Holland the drained low

fens are more largely used for tillage. In Friesland, where the low fens rest mainly on sand, such drainage operations have been rare. In Groningen the low fens rest largely on clay, which in many places has been dug up and mixed with the surface deposits, so as to form a good soil for agriculture.

The high fens, where not reclaimed, are mostly occupied by heaths, in places intermingled with shrubs, but were formerly to a large extent covered with trees—forests of oaks, beeches, and conifers. The fall of those trees, when age had rendered them unable to withstand the strong south-westerly winds, has gradually covered the ground with rotting trunks, arresting the natural flow of the water, so that in process of time the soil has become too sodden for an arboreal vegetation, and fit only for the low plants and shrubs which now cover it. The largest high fens are the Boertanger Morass in Groningen, extending into the Prussian province of Hanover, where it is known as the Bourtanger Moor, the Ostermoer (East Morass), and Zuidenveld fen in Drente, the Almelo fen in Overijssel, and the Peel in Limburg and North Brabant.

The usual mode of reclaiming high fens consists in first burning off the top layer, whereby a covering of ashes is spread over that which lies underneath. Thus a soil is obtained fit for the growth of fen buckwheat, and is gradually rendered capable of producing crops of greater value. But for this the procedure has to be more thorough, and the reclamation is carried on by means of fen-colonies, as they are called. For the numerous labourers who are required for the work of reclamation, dwellings are erected and surrounded by small enclosures, which are made fit for cultivation, and then diligently cultivated. First, a canal is cut through

the land to be reclaimed. The peat which forms the upper part of the high fens is cut and carried away on this canal. As the cutting proceeds, side canals are formed, and the settlements extend along the main canal and its branches, which form almost the sole means of communication. Roads are difficult to make in such tracts, and such as are made are not fit for wheeled vehicles. Shops of various kinds soon spring up in the midst of the settlements formed for those who clear and cultivate the ground, and lime-burning, brick-making, and glass-blowing are largely carried on to utilise the peat fuel. Starch and treacle works also arise, in consequence of the fact that the potatoes grown on such clearings are fit for no other use. Thus in various ways the fen colonies come to be among the flourishing places of the country.

The most important of these fen colonies are Old and New (Oude and Nieuwe) Pekela, Hoogezand, Sappemeer, Veendam, Wildervank, and Stadskanaal in Groningen; Nieuw-Amsterdam, Nieuw-Dordrecht, Erica, and Hoogeveen in Drente, and Heerenveen in Friesland. Before 1600 no habitations were to be seen on the sites now occupied by those flourishing settlements. Most of them were formed only in the nineteenth century. Old and New Pekela arose in the beginning, and Wildervank in the middle of the seventeenth century.

5. The Dunes

The sand-dunes and blown sand of the Netherlands occupy in all about 290 square miles or $1\frac{1}{2}$ per cent of the surface. The dunes, a continuation of those of France and Belgium, vary from about 25 to upwards of 10,000 feet in width, and 50 to rather less than 200 feet in

height. Their narrowest part is near 's Gravenzande, and their widest between Scheveningen and Katwijk, where a succession of sand-dunes lying behind one another attain in all a width of more than 2 miles. At Petten (north-west of Alkmaar) a pass in the dunes was formed by a violent storm, in consequence of which artificial dykes have had to be built here to keep out the sea, the chief being the Hondsbossche, which has a length of more than 3 miles and a height of 18 feet. Formerly a continuous forest is said to have stretched along the inner margin of the dunes throughout their length, and of this ancient forest the well-wooded districts of Alkmaar, Bloemendaal, Haarlem, Wassenaar, 's Gravenhage (the Hague), and Loosduinen appear to be remnants.

Blown sand still covers a considerable, though gradually diminishing area, especially in Drente, Overijssel, Gelderland, and North Brabant. In the Veluwe alone it occupied not many years ago nearly 40 square miles.

6. Older Rocks of the Netherlands.

The rocks older than those of the Quaternary group are confined to southern Limburg, the east of Gelderland and Overijssel, and parts of Zeeland. The coal-measures are represented among the Primary rocks of Limburg, and mines, which are leased by the State to the Aachen-Maastricht railway, are worked at Kerkrade, producing annually about 80,000 tons of coal. Cretaceous limestones extending from Maastricht eastwards to the neighbourhood of Aachen are among the secondary formations of Limburg, and from the hill of St. Pietersberg, in which numerous galleries have been formed by the working of the rock for building-stone.

To the Tertiary period belong some sands and loams

to the north of the Geul (southern Limburg), and some loams in Zeeland (near Aardenburg, etc.), and to the same period belong the older formations of Overijssel and Gelderland (at Winterswijk), these being also mainly loams, characterised in these last localities by a great wealth of fossils.

7. The Polders

The polders of the Netherlands include not merely the reclaimed low fens or *droogmakerijen*, but also the sea-polders, which have been formed by the gradual accumulation of silt on the outside of the sea-dykes. Sometimes artificial means are taken to hasten this accumulation. Consolidation takes place through the growth first of plants that grow only in salt water, afterwards of others of a less saline character growing on dry ground or ground that is mostly dry, and forming a very good pasture for cattle. The ground is then enclosed and protected against any encroachment of the sea. For the most part sea-polders are naturally drained at low tide, but the fen-polders are necessarily drained entirely by pumping. This drainage is carried out to a greater or less extent according to the purpose to which the polder is devoted. When the land is pasture land it is enough to keep the inner water at a level of about 16 inches below the surface, but if it is arable land it must be drained to a depth of from 30 to 50 inches. In summer, when the evaporation exceeds the rainfall, it may even be necessary to pump the other way, and supply the polders with water from the rivers and canals, which form the receptacles of all surplus water.

Before the embanking of Holland and Zeeland began, the population of those provinces was very scanty, and

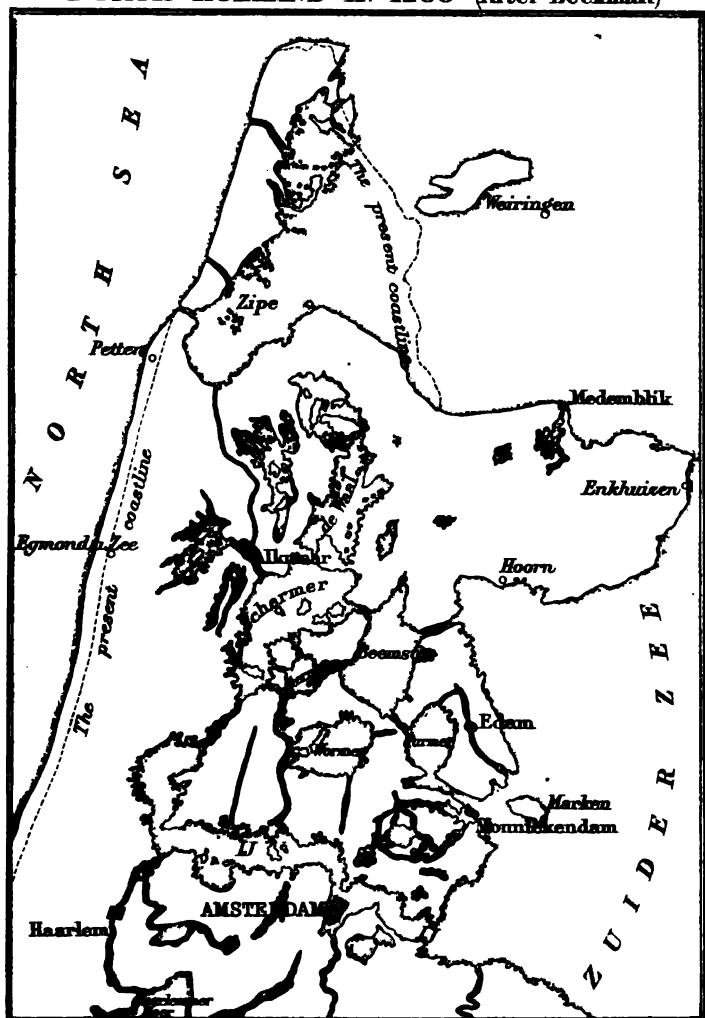
confined to artificial mounds such as are still met with in Groningen, Friesland, and parts of Zeeland. The construction of dykes began in the early period of the counts, and the title of dyke-counts (*dijkgraven*) was given to those specially entrusted with the supervision of these structures. William II., Floris V., and Duke Albert are those specially associated with the inauguration of this system of reclamation.

The oldest of the fen-polders are in North Holland, and date from the middle of the sixteenth, the larger ones from the seventeenth century. That of Beemster, for example, was formed in 1612, that of Purmer in 1622, that of Hugowaard in 1625, that of Wormer in 1637, that of Schermer in 1635. The oldest in South Holland is that of Zoetermeer, dating from 1614. The accompanying maps show the extent of reclamation accomplished.

The largest of all the polders in the Netherlands, that by which the *Haarlemmermeer* was reclaimed, dates only from the middle of the nineteenth century. Originally this area was partly under water, partly dry land. In the thirteenth century there were three separate lakes in it, with a united area of 22,500 acres, but in the nineteenth century these had coalesced into one of more than double the size. As early as 1643 a project for reclamation was brought forward by Jan Adriaanszoon Leeghwater, and others were formed by Cruquins and Lijnden in the two following centuries. But not till 1839 was the work seriously taken in hand. The entire area was surrounded by a dyke 33 miles in circumference, and was subdivided by smaller dykes. On the outer dyke were planted three powerful steam-engines for drainage, these being named in honour of the three original projectors just mentioned, and in July 1852 the

To face page 50

NORTH HOLLAND IN 1288 (After Beekman)



Scale of Miles
0 10 20

Stanford's Geograph. Estab. London

London: Edward Stanford, 12, 13 & 14, Long Acre, W.C.

drainage was completed, an area of 47,100 acres, equal to about one-tenth of that of the county of Buckingham, being thus reclaimed.

An area of about the same extent or perhaps even larger has been empoldered and reclaimed on the Dollart, which in the beginning of the sixteenth century extended in two gulfs far to the south and south-west of its present limits, the towns or villages of Noordbroek, Zuidbroek, Mitwolde, and Winschoten then lying on its margin, but of this reclaimed area only about four-fifths belongs to the Netherlands, the remainder to Prussia (Hanover).

But the greatest of all the schemes of this nature are those for the reclamation of a larger or smaller portion of the Zuider Zee. Several such schemes have been proposed since the middle of the nineteenth century, and in 1894 a royal commission appointed to inquire into these schemes reported in favour of the immediate commencement of one for the draining of about 450,000 acres, by far the greater part of which would consist of fertile land, in the south of this sea. In 1901 a Bill was introduced in the States-General for the carrying out of a scheme on a more limited scale, but it was soon withdrawn.

8. People—Elements of the Population—Position of the Dutch in the Teutonic Family—National Traits

The whole of the Netherlands, taking them in their widest geographical sense, so as to include all the region to the north and west of Middle Belgium, are no less ethnically than physically divided into two great sections. The inhabitants of the south fell early under the influence and the sway of the southern and alien powers, while

those of the north were from the first a freedom-loving isolated race, devoted mainly to fishing and a seafaring life. Hence it naturally followed that their influence prevailed in the Zeeland or Scheldt group of islands. The Zeelanders, or *Zeeuw*s, as the Hollanders call them, are kinsmen of the Dutch proper, and being like them an island people, took part with them in all their political movements, although the Scheldt archipelago, as physically belonging to the region of the Scheldt, might be, and in fact has been, claimed by the Flemings.

The north is in all respects the more rugged and younger brother of the south, and the national speech and usages, character and customs, gradually assumed distinctive features independent of each other, and ever departing more and more from the common original type. In this way was brought about the great divorce of the Belgo-Batavian family, branching off on the one hand into the Dutch or northern, on the other into the Flemish or southern nationality.

Besides the Flemings, who form 13 per cent of the people in the kingdom of Holland, and reside in the provinces of North Brabant and Limburg, there live a small number of Low Germans, 2 per cent altogether, in Dutch Limburg. But the great majority of the inhabitants of the Netherlands are the Dutch;¹ or,

¹ In order the better to understand what follows, it will be well to remember that the English term "Dutch" is entirely a misnomer as ordinarily used. Etymologically, it is simply the German word "*Deutsch*"; that is, "*Teutsch*"; that is, "*Teuton*"; and is therefore the most generic name for the whole Teutonic or Germanic family, thus properly including not only the High and Low Germans and the Scandinavians, but the English people themselves, so far as they are ethnically descended from the Angles and Saxons of Low Germany. But, according to English usage, *Dutch* has now come to mean nothing more than a very small section of Low Germans dwelling in the Rhine delta. It remains to be stated, that the Germans themselves never extend the word *Deutsch* to

perhaps better, the Netherlands, properly so called, descendants of the old Teutonic Batavians. Chiefly settled in the provinces of North and South Holland, Zeeland, Utrecht, and Gelderland, they form 71 per cent of the entire population; the remaining 14 per cent consisting of the Frisians, also a Low German race, who now occupy Friesland, Groningen, Drente, and Overijssel; but who formerly,—that is, before the irruption of the Zuider Zee—were unquestionably spread over the present province of North Holland also. The resemblance in many respects, even in the dress, between the North Hollanders and the Frisians, may still be easily detected by the observant traveller.

Ethnically speaking, both Hollanders and Flemings form a race presenting in its peculiar customs and social features a profound contrast to its German neighbours. Until quite recently efforts continued to be made absolutely to ignore the distinctive nationality of the Netherlands, and to regard them as differing only in their peculiar dialect from the rest of the Germans. But the utter fallacy of this view becomes apparent when we begin to form some clear conception of the affinities of the Teutonic races. From the now lost prehistoric Teuton speech there sprang the three branches, usually known as the Gothic, Scandinavian, and Germanic, with the last of which alone we are here concerned. This Germanic stock again branched off into the Old High German and the Old Low German, the first giving birth to three dialects—the Frankish, Bavarian, and Alemannic; the last-named being identical with the Middle High German, which, later on, merged in the

the Netherlands, now restricting its use to all the High Germans and to all the Low Germans excepting the Netherlands, Flemings, and English.

present current New High German, the ordinary German of literature.

The long extinct Old Low German gave rise to two distinct and well-known offshoots, the Old or Continental Saxon and the Frisian, which last still survives in various dialectic forms in West and North Friesland, on Heligoland and Wangeroog, and in Saterland. From the Old Saxon again there sprang the Anglo-Saxon, the Old Netherlandish, and the Old Platt Deutsch or Lowland German, of which the last two have left scarcely any, if any, written records behind them. But all three became in course of time subject to certain modifying influences; so that out of the Anglo-Saxon arose the modern English, out of the Old Netherlandish the Middle Netherlandish, and out of the Middle Lowland German the modern Platt Deutsch. From the Middle Netherlandish, which is rich in literary monuments, is derived the New Netherlandish, usually called Dutch, with which the Flemish is practically identical.

Thus we see that neither Dutch nor Flemish is a dialect or patois; consequently in no sense are they daughters of the German, but are both as far removed from it as is English, each of them having developed from a collateral stock. Nay, more, the Platt Deutsch or Lowland German itself is also quite as remote from New High German as are the English and Dutch. They cannot even be called sister languages, the relations being at the utmost rather those of cousins-german. And this is quite as applicable to the people themselves as to their speech. The ethnologist, at all events, can have no sort of doubt that the claims of no people to a distinct nationality are more justified than those of the modern Hollanders. In their habits and pursuits they show far greater affinity to the English than to the Germans, and

they are themselves fully conscious of this truth. Hence the Dutchman, as a rule, will have nothing to do with the German, and is fully as ready energetically to repel all encroachments on his marshy meadow-lands as in the days of William the Silent; and it may be added that, for this purpose, his grand system of canalisation would be likely to stand him in as good stead as on former occasions.

Even were he not hardened by his ceaseless struggles with the watery element, from which he has been fain to rescue the very ground inch by inch, the Dutchman would still be the Englishman of the mainland. In the streets we read the same familiar announcements as in the English seaports—outfittings for the East and West Indies, transatlantic steamship companies, commission agencies for Brazil, booksellers' shops devoted exclusively to works on navigation, colonial affairs, and the like. At a review in the Hague we may see the colonel decorating an officer for distinguished service amongst Daiaks of Borneo, and the strange-sounding names of the Malay Archipelago are in everybody's mouth. In the *salons* we may even hear the soft sounds of the Javanese language on the lips of young ladies and gentlemen, and there are few members of the upper circles in society that have not been at least once to the Indies. The scions of well-to-do merchant houses go to learn business in Batavia or Brazil. After a few years spent in the tropics, these young men, still in their twenty-fourth or twenty-fifth year, return home with matured views and rich experiences of the strange lands visited by them. And even if not belonging to the trading classes, their duties as military men or government officials will often require them to pass some time in the East Indian Archipelago. For next to England the kingdom

of the Netherlands possesses the greatest colonial dominions.¹

Three-fifths of the people belong to the Protestant confession, and the remainder chiefly to the Roman Catholic Church. Of Jews, mainly descendants of Spanish refugees from the persecutions of Philip II., there are some 100,000, of whom 40,000 are in Amsterdam alone, so that this element is very largely represented in the Netherlands.

The intellectual culture of the Dutch stands on a very high level. The greatest attention is paid to public instruction, every village, however small, being provided with an efficient elementary school. Equally well administered are the poor-laws, and public mendicity is a thing unknown in this happy and prosperous little state.

9. Commerce and Industry

The advantages that the provinces composing the kingdom of the Netherlands derive from its rich reclaimed soil, its navigable rivers and canals, its extensive coast-line, its fine seaports, and its position with reference to the wealthiest and most populous regions of Europe are obvious, but are hardly sufficient to account for the commanding position which these territories once enjoyed in respect of industry, commerce, and wealth. To account for the extraordinary rise of this country in the sixteenth and seventeenth centuries historical conditions must be kept in view.

Of the early history of these territories, only a few glimpses can be obtained. A count of Holland, or rather Holtland ("woodland"), is mentioned as early as the ninth or tenth century, but the country was then

¹ Total area about 783,000 sq. miles ; pop. about 35,000,000.

only a small territory in the neighbourhood of the Merwede and the Maas, and its name probably indicates its general character at that time. Reclamation seems to have begun in the south, advancing from Flanders northwards. In the middle of the twelfth century the inhabitants were already noted for their skill in dealing with marshes. A settlement of Netherlanders was then made by Albert the Bear of Brandenburg on lands deserted by the Slavs, whom he had defeated. The lands they selected were the low and marshy tracts on the Elbe extending to the forests of Bohemia, and this region they in a short time rendered incredibly rich and flourishing. But these settlers were Flemings and Zeelanders. In the middle of the next century, however (the thirteenth), we meet with a sign of progress in the north of the present Holland. A canal at Spaarndam was then begun, and it was appointed that the expenses should be paid by a toll on the ships passing through. The herring fishery no doubt occupied the attention of the inhabitants from a very early date, and early in the fifteenth century (1414) it received a great stimulus from the discovery of the method of drying and barrelling herrings by Jacob Beukelszoon of Beervliet. Two years later the first large herring seine was manufactured at Hoorn. Little more than a hundred years later the merchant shipping of Holland had become so great that when in 1532 the Baltic trade of that province was stopped by Christian of Denmark, four hundred merchantmen that usually navigated that sea lay idle, and ten thousand seamen were thrown out of employment.

But the chief cause of the rapid rise of the Netherlands to wealth and political power was a seeming misfortune. The bigotry and tyranny of Philip II. of

Spain, to whom these provinces, with those now forming the kingdom of Belgium, were subject, drove the northern provinces into revolt (1579), and the favourable conjuncture of circumstances enabled them to defy successfully the power and wealth of Spain, and greatly to develop their commerce and industry as they did so. The obedient provinces in the south suffered, and the advantages which, as is shown in the previous chapter, they enjoyed from the Rhine navigation, passed to the rising ports of Amsterdam, Rotterdam, Dordrecht, and others in the north. Amsterdam was especially favoured by the isolation and security of its position. Merchants and artisans from the Spanish Netherlands were attracted in large numbers by the freedom which could be enjoyed in the new states. Political conditions prevented France and Germany from becoming serious rivals in arts and commerce, and England was still struggling to emerge from the condition of a country producing only raw materials to that of a manufacturing and mercantile people. Hence the industry, commerce, and shipping of the Netherlands grew with unparalleled rapidity. The manufacture of woollens, silks, linens, lace, tapestry, pins, paper, and other commodities was carried to a pitch of perfection exceeding that of any other nation. In spite of laws and decrees the wealth that Spain derived from her possessions in both hemispheres was spent on Netherlandish products, and early in the seventeenth century the Dutch took advantage of the union of Portugal with Spain to direct their enmity against that country also, and to carry the warfare into eastern seas. Very speedily they established a dominion in the East outvying that of the Portuguese, and obtained directly from eastern ports the commodities that they had formerly bought of the Portuguese in Lisbon. The

vast expenses of the war were thus borne with ease, and in the circumstances described the war itself, apart from any conquests, probably accelerated the growth of Dutch wealth. The Dutch were beyond comparison the leading power at sea, and had the bulk of the mercantile shipping, and while the war added to the risks of commerce, these risks would in the long run have to be paid for by the purchasers of the goods, and would thus only add to the profits of the merchants. Within the provinces there was still ample room for internal development and expansion, and some of the most important works of reclamation belong to this period.

The Netherlands still enjoy great geographical advantages, though the relative importance of these advantages has been greatly altered since the seventeenth century by a variety of circumstances. Political and other conditions no longer prevent or diminish the rivalry of surrounding countries. The intensified national feeling of its eastern neighbour even impairs the value of one of the greatest of its natural advantages, the navigation of the Rhine. Apart from that the relative importance of its advantages in respect of this and other waterways has been reduced by the enormous improvement in the means of communication by land. And lastly, since the application of coal to industrial production, the Netherlands have been greatly handicapped in the competition by its lack of this mineral and its great abundance in neighbouring countries. It still, however, possesses its rich soil, its fine seaports, its natural and artificial waterways, and, of necessity, its admirable situation,—a situation, it must be remembered, all the more valuable in consequence of the increased and increasing prosperity of its neighbours. This one fact is enough to countervail all the circumstances that

have tended to lower the relative position of this country, which accordingly is steadily increasing in wealth and population. Its population has indeed, in recent decades, increased even more rapidly than either England or Belgium, with all their extraordinary industrial development, and the most rapidly growing province, North Holland, shows a greater rate of increase of population than even the most industrial parts of Germany—Westphalia and Saxony.

This high density is chiefly due to agriculture and commerce. Nowhere do the ordinary cereals of the temperate zone—wheat, rye, and oats—yield a higher produce per acre than in these rich provinces, which are also renowned for their horses and cattle. Upwards of 70 per cent of the available surface of the entire country (excluding town and village sites and ground occupied by railways, canals, etc.) is utilised for agriculture in the widest sense, including pasturage, or is occupied by woods and nurseries. Besides the cereals above-mentioned large quantities of barley, spelt, and buckwheat, beans, peas, and seeds are grown. There is also a large area under potatoes (larger than that under any cereal except rye), and a greater or less area under artificial pasture-grasses, fodder crops, sugar-beet, flax, hemp, chicory, madder, tobacco, and hops.

Manufacturing industries, moreover, are not wanting. Foremost stand shipbuilding and the manufactures dependent on it. The character of the country naturally gives the making of hydraulic machinery an important place among such industries, and among the others are those connected with the utilisation of native and colonial products—spirit-distilling and brewing, brick and pottery making, sugar-refining, the manufacture of leather, margarine, oil, and soap, of tobacco, cigars, and cacao.

The textile industries, in consequence of the deficiency of coal, are of subordinate rank, but are not neglected.

Besides those engaged in trade and commerce, a large number of the daring and hardy seaboard population are occupied with the deep-sea fisheries, while the coasts of the North Sea yield plaice, soles, mussels, and large numbers of oysters, and the Zuider Zee supplies anchovies, shrimps, flounders, and eels, besides herring.

10. Chief Towns : The Hague, Amsterdam—the Dead Cities of the Zuider Zee.

The seat of government and residence of the king is *The Hague*, in Dutch 's *Gravenhage* ("The Count's



THE HAGUE : THE MUSEUM.

Hedge") or *Den Haag*,¹ one of the handsomest and most elegant cities in Europe. But the true capital of

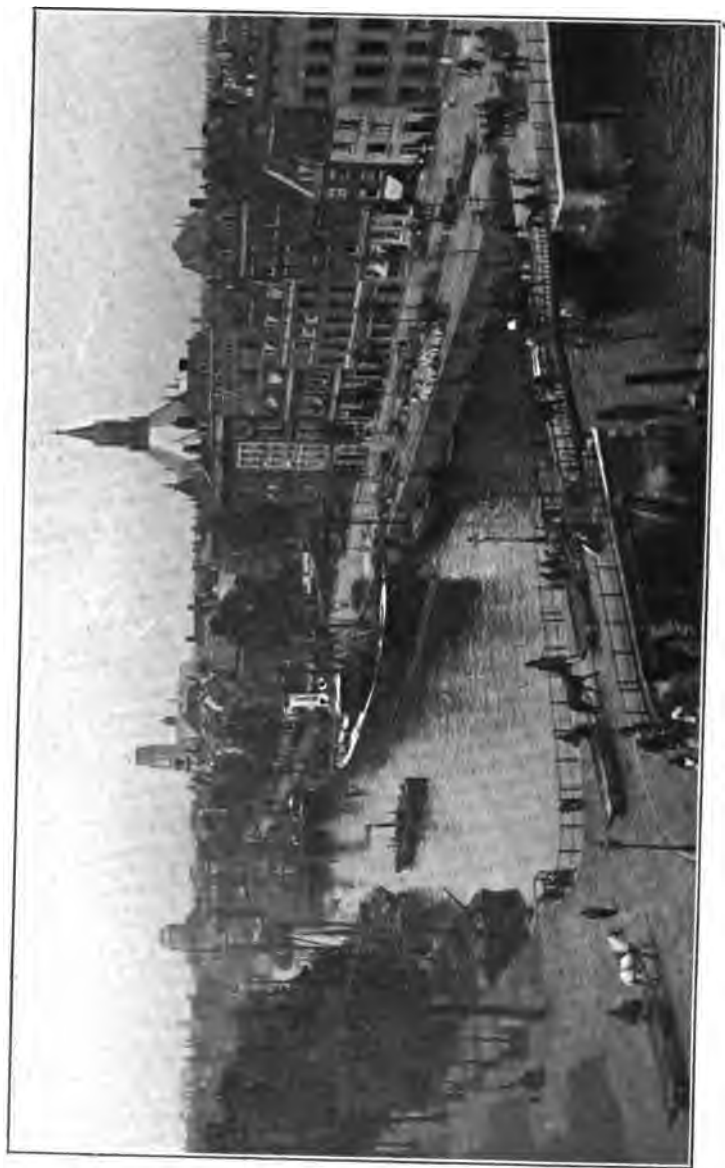
¹ Pop. (1899), including the neighbouring watering-place of Scheveningen, which belongs to the commune, 205,000.



AMSTERDAM.

the Netherlands is, and always has been, at least commercially, *Amsterdam*,¹ the seat of a royal palace and of several royal establishments, and of a communal university, the place in which by law the king must be formally enthroned, the centre of the defensive system of the country, and the chief industrial centre of the kingdom. A lord of the Amstel is first mentioned early in the twelfth century, but it was only in 1300 or 1301 that the small settlement that there grew up was raised to the dignity of a town, which moreover had no importance till the revolt of 1579 gave to its site the peculiar advantages that, as we have already seen, made it the refuge of a numerous and industrious population. Within fifty years after the revolt its numbers had increased to 105,000 (1622), and forty years later its population reached 200,000. In commerce and shipping, as in other respects, it then took the lead among the towns of the Netherlands, but under the changed conditions that peace and security have brought it has long been eclipsed in these respects by the much more favourably situated emporium of Rotterdam. Originally the only access to Amsterdam for sea-going ships was by the shallow Zuider Zee, but this fact, which was an important guarantee for its safety, was a hindrance to its commerce, and hence, in the present century, other means of approach have been provided. In 1824 a canal, with a depth of 21 feet, leading to the fortress of Helder at the north end of the mainland of the province, was opened, but a much more important work for the commerce of Amsterdam was the direct connection of the IJ, the former inlet of the Zuider Zee, on which the city stands, with the North Sea at IJmuiden, in 1876. By this work, which enables vessels of the largest size to reach

¹ Pop. (1899), 524,000.



ROTTERDAM.

Amsterdam, the tonnage entering the port was promptly raised from about 500,000 to 1,500,000 tons. But a connection with the great natural waterway of the country was still wanting, and this was established in 1892 by the opening of the Merwede Canal, connecting Amsterdam with Vreeswijk and Gorinchem (Gorkum). Though the depth of this waterway is only $10\frac{1}{4}$ feet, it has already proved of great importance.



DORDRECHT.

But the great advantage of the natural waterway of the Rhine is shown by the fact that the tonnage that enters the port of *Rotterdam*¹ (which now includes *Delfshaven*) with cargo is about four times that that enters the port of Amsterdam. Its shipping nearly equals that of Antwerp, and is growing at a much more rapid rate.² It has already been indicated

¹ Pop. (1899), 320,000.

² The shipping entered with cargoes and in ballast in 1900 was 5,970,000
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that in competition with Antwerp there is one physical disadvantage under which Rotterdam suffers—the smaller depth of water. Constant efforts are, however, being made to improve the port by providing every accommodation for the large ships of the present day. The port now has 131 acres of water area with nearly 9 miles of quay on the right bank of the river, and 152 acres of water area with 6 miles of quay on the left



HOTEL DE VILLE, DELFT.

bank. It must, moreover, be remembered that Rotterdam is only one of the Dutch ports of the Rhine, and if we add the tonnage of Dordrecht, Schiedam, and Maasluis (in the aggregate about one-ninth of that of Rotterdam, if we consider only the tonnage entered with cargoes) the advantages of the Rhine and its connections stand

register tons against 6,691,000 register tons entered at Antwerp in the same year. The tonnage for Rotterdam, however, showed an increase in ten years of over 100 per cent as against rather less than 50 per cent for Antwerp.

out still more conspicuously. It is a noteworthy feature of Dutch shipping generally, and above all at the principal ports, that the tonnage cleared with cargoes bears but a small proportion to that which enters. The principal reason is, that while Dutch ports are the centres of distribution for large quantities of produce imported from the Dutch colonies, as well as from foreign countries, both for home and foreign consumption,



HAARLEM.

they are not used to the same extent for the despatch of goods of foreign, or, we may say, more particularly of German origin. The preference given in Germany to German ports appears to prevent that country from using to the full the advantage of the Rhine as an outlet for its goods.

Besides these three cities there are a considerable number of towns, varying in size and importance, all crowded together in a narrow compass. Amongst them

are *Delft*,¹ *Haarlem*,² *Schiedam*, *Dordrecht*,³ the two university towns of *Leiden* and *Utrecht*, and some others. *Leiden*,⁴ on the Old Rhine, is frequently described as the oldest town in Holland, being identified with the Roman Lugdunum Batavorum; but this identification is extremely doubtful—in Holland is said to be generally discredited, the similarity of the name being attributed to mere coincidence.⁵ The first certain mention of the



LEIDEN.

town is in the eleventh century. Its fame began with its heroic resistance to the siege of the Spaniards from 31st March 1573 to 21st March 1574, to commemorate which its university was founded on the 8th of February 1575. This university, with its admirable collections, still maintains for it a European reputation, and in the seventeenth and eighteenth centuries, when it had among

¹ Pop. (1899), 32,000.

² Pop. (1899), 65,000.

³ Pop. (1899), 38,000.

⁴ Pop. (1899), 53,000.

⁵ Egli, *Nomina Geographica*, 2nd ed. s.v.

its professors Salmasius, Grotius, and Boerhaave, it enjoyed a high renown. *Utrecht*,¹ situated where the Crooked Rhine branches off into the canalised Old Rhine and Vecht (Stichtsche or Hollandsche Vecht), is another town whose name is popularly, but very doubtfully, traced to a Roman origin (*trajectus*, from which has been formed the name applied to it in Latin,



UTRECHT.

Ultrajectus). It is first known as a place surrounding a princely palace in the beginning of the eleventh century, and containing also the seat of a bishop. The chapter-house of its cathedral is celebrated in Dutch history as the place where the union of the revolted provinces was brought about (1579). The town is also noted as the place where the peace that put an end to the War of

¹ Pop. (1899), 102,000.

the Spanish Succession was concluded in 1713. The university dates from 1633. In the eastern provinces are *Zwolle*,¹ *Leeuwarden*,² and *Groningen*,³ and in the east of Overijssel, the three small cotton-manufacturing towns of *Hengelo*, *Enschede*, and *Almelo*. Probably nothing but the cheapness of the land and the want of other occupations led to the establishment of the industry in this district, which has no connection by water and is not even connected by rail by any very direct route with the Rhenish coalfield; but here nevertheless it has been carried on with more or less success since the close of the eighteenth century. Round about the Zuider Zee lie a number of places, such as Hindeloopen, Molkwerum, Edam, Hoorn, Enkhuizen, Medemblik, and Stavoren, at one time wealthy and prosperous, but now not inaptly named "the dead cities of the Zuider Zee." *Harlingen*, the port of Leeuwarden, possessing a harbour with a depth of 14 or 15 feet on the bar at neap, and 15 or 16 feet at spring tides, is the one port on this sea which still maintains a considerable trade under modern conditions, exporting large quantities of butter, cheese, and timber to England.

¹ Pop. (1899), 31,000.

² Pop. (1899), 32,000.

³ Pop. (1899), 67,000.

CHAPTER III

GRAND-DUCHY OF LUXEMBURG

THIS is a small independent state, just under 1000 square miles in extent, somewhat smaller in area accordingly than the English county of Durham, lying to the south-east of Belgium, its northern portion forming a wedge of the Ardennes, separated from the Eifel and the province of Rhenish Prussia by the valleys of the Our and Sauer (French Sure), its southern portion belonging to the skirts of the plateau of Lorraine. The Ardennes wedge, known as the Ösling or Eisling, forms the higher part of the territory, a tract at the height of 1300 to 1600 feet, deeply furrowed by narrow winding river-valleys, but even the south, which generally approaches or exceeds 1000 feet in altitude, with valleys at the height of 450 to 650 feet, has somewhat of the same character, and presents a variety of picturesque scenery. One line of valleys traverses almost the whole state in its middle line from north to south, but the valleys slope in opposite directions, meeting in that of the Sauer, which crosses the state from west to east, and then, turning south-east and finally south, carries the bulk of its drainage into the Moselle, which, along with these latter portions of the Sauer and the lower course of its tributary the Our, forms the eastern frontier of the state. The northern portion of the state is in every respect the least productive. The southern portion, the Gutland ("good land"), contains



LUXEMBURG.

fertile soils mainly belonging to the Keuper and the Muschelkalk, members of the Triassic system, which is so largely developed in Central Europe, and the agricultural wealth due to this circumstance is enhanced by the fact that in the extreme south-west of the grand-duchy, chiefly round Esch, occur some of the most productive iron-mines of Europe, yielding upwards of 5,000,000 tons of ore annually, a considerable proportion of which is smelted within the grand-duchy.

The capital of the grand-duchy is a town of the same name, containing about 20,000 inhabitants, situated on the Alzette, the chief southern tributary of the Sauer. It is first mentioned in 738 as *Lucilinburch*, afterwards in the tenth century as *Lutlinburg*, and it is still sometimes known as *Lützelburg*. The first part of the name is without doubt cognate with the English "little," and hence the meaning is Little Castle. The holder of this castle in 1120 took the title of Count of Luxemburg, and the county was raised to the rank of a duchy in 1354 under the Emperor Charles IV., a member of this family. The duchy, however, was then more extensive, embracing also what is now the Belgian province of Luxemburg, which was ceded to Belgium in 1839. The ceded portion was and is mainly French in language, but the remainder is pure German, and formed part of the German Confederation till the dissolution of that union in 1866. In 1867 it was declared neutral territory under the guarantee of the great powers, and the fortress of Luxemburg was then demolished. Luxemburg, however, remained, and still remains, a portion of the German Customs Union (*Zollverein*), a fact which adds greatly to the value of its deposits of iron-ore. From 1815 to 1890 the King of Holland was also grand-duke of Luxemburg, but since that date there has been a separate dynasty.

THE BRITISH ISLES

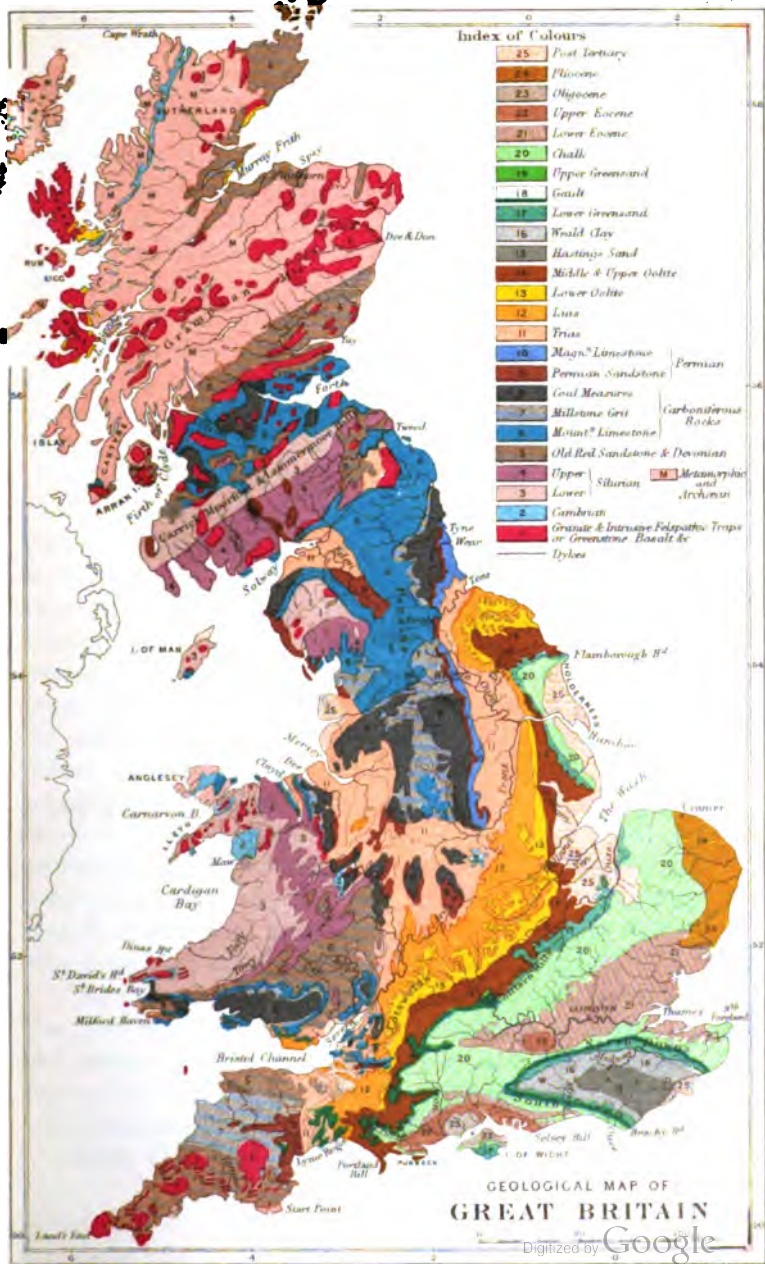
CHAPTER IV

THE NORTH OF ENGLAND

1. Introductory: Sketch of the Geography of Great Britain

THE country which we now know as England has not yet existed for a thousand years within the boundary that finally came to be recognised as separating it from Scotland. The settlement of this boundary formed an important part of the early history of England, and for this, among other reasons, it is necessary to prefix to our more special description of the geography of England a general sketch of that of the islands to which it belongs.

This island lies off the north-west of Europe, roughly speaking between the 50th and 60th parallels of latitude, and divided by a strait rather more than 20 miles wide from the nearest part of the mainland. The northern and western parts of the island are for the most part mountainous or at least hilly, the south-east, on the other hand, low-lying, with only small areas above 500 feet in height, and the surface gently undulating or level. The higher parts are also geologically the older, for the most part indeed of great geological antiquity, considerable areas in the extreme north-west dating from the beginning of geological time. It is, without doubt, owing to



this fact that these high-grounds of Britain have acquired the form which they now possess. We may safely assume that throughout a long period of geological time the prevailing rain-bearing winds have been, as they are now, from the south-west. These rocks have hence, through countless ages, been exposed to the wearing action of falling and running water. This action must have greatly lowered their altitude, and when that altitude was greater the rainfall would be even heavier than now, the erosion accordingly much more active. It is estimated that in comparatively recent (post-Miocene) times the higher peaks of Britain were about 3000 feet higher than they are now above the present sea-level, and as the sea-level of these times relatively to this portion of the land area was 3000 feet lower than it is now, the absolute elevation of those higher peaks must then have been about 9000-10,000 feet. We cannot tell what the climate may have been in early geological eras, but this relative depression of the sea-level continued down to a much more recent date, when we know that the climate was for long periods much colder than it is now. The more powerful action of melting and freezing has therefore also to be taken into account in estimating the forces that have acted for prolonged periods on the higher surfaces of Britain, and during the colder ages we must add the action of moving masses of ice, for in those ages the greater part of Britain was more than once covered with a vast ice-sheet.

The general result is that the elevated area of Britain has been worn into an intricate assemblage of mountains and valleys, presenting, however, local differences according to the nature of the rocks of which they are composed, and other modifying circumstances.

South of the middle Lowlands of Scotland another

region of highlands—less rugged, however, than those of the north-west—extend to the English boundary, where they are known as the Cheviot Hills. With these and the region round about them we may begin our more detailed account of the physical features of England.

2. Details of the Geography of the North of England

From Berwick-upon-Tweed, the northernmost point of England, the meridian of 2° W. runs for about 190 miles, or more than half its length, within great Britain, to near the Weaver Hills in the angle between the rivers Dove and Churnet, mainly through a series of Carboniferous rocks of older date than the coal-measures. These older Carboniferous rocks form one of the most important geographical features of England. Though not all at a high elevation they contain the greater part of the high grounds of the country, and in virtue of that they form a dividing line between east and west, and that to an extent which is in a large measure concealed by most modern maps in the southern part of the area owing to the rapid growth of towns in this region in quite recent times, and the consequent closeness of the network of railways. But the reality of the dividing line might still be made evident by a map showing the distribution of villages on the east and west, and is apparent to any one who makes the railway journey from Manchester to Sheffield, and observes the broad stretch of scantily-inhabited sheep-walks or uninhabited moorlands that have to be crossed before piercing these highlands in the Woodhead tunnel between the valleys of the Etherow and the Don.

The most abundant rocks of this region are those of the Lower Carboniferous series, consisting mainly of lime-

stones, known from the elevation at which they frequently



LIMESTONE CLIFFS, HIGH TOR, MATLOCK.

occur, and are always most conspicuous, as the Mountain Limestone. The light grey perpendicular-fronted cliffs so

characteristic of these rocks on mountain sides are well seen on the London and North-Western Railway on Shap Fells, and on the Midland Railway near Settle, and if one climbs to the top of these cliffs one gets a good idea of the nature of the weathering by which these rocks are worn away, an intricate network of fissures spreading in all directions over a nearly flat surface. On the Midland line from Manchester to Derby one gets an excellent idea of the manner in which these rocks have been hollowed out into deep valleys by the streams draining their southern extremity.

Considerable patches of the higher grounds are still covered with rocks of the Millstone Grit series, consisting mostly of soft shales worn on the mountain sides into gentle slopes, alternating with strata of the coarse sandstone to which the series owes its name. On the sides of isolated peaks of the series, like Baugh (Bow) Fell, to the west of the Midland Railway north of Dentdale, and the heights of the tract between Wensleydale and the valley of the Greta, these strata of Millstone Grit stand out in precipitous rings overhanging the shales. In other cases they form extensive caps for the mountains, as on Ingleborough, Pennyghent, and Wharfedale, farther south on or near the same line. On the high grounds between Skipton and Glossop, or in other words between the upper valley of the Aire and the Etherow-Don portion of the Manchester - Sheffield route already mentioned, a district for the most part at a lower elevation than the rest of the tract now spoken of, the Millstone Grit series are the prevailing rocks. In this area three pairs of river valleys on opposite sides are brought so near to one another, and the chain in these places is so much lowered in elevation, as greatly to facilitate communication between Lancashire and Yorkshire. Even before railways were

laid along these routes, canals constructed along the same lines had proved of great importance in the development of internal trade at the period of the rapid development of English manufactures at the end of the eighteenth and beginning of the nineteenth century. The narrowest and lowest of these relative depressions is that between the valleys of the Ribble and the Aire near Skipton, across which is laid the Leeds and Liverpool Canal. Its summit is only 477 feet above sea-level. The next is that between the Roch and the Calder, crossed by the Rochdale Canal at a height little greater. The third is that between the Tame and the Colne valleys, connecting Manchester and Huddersfield. Its summit is the highest of the three, and indeed the highest attained by any English canal, 656 feet above sea-level; and the canal, like the more recent railway, here passes through the chain in a tunnel more than three miles in length.

Farther south, where the Carboniferous Limestone again forms the greater part of the surface, a well-marked steep-sided plateau of coarse sandstone, belonging to the bottom of the Millstone Grit series, forms the summit of Kinder Scout, the highest part of the Peak District (2088 feet).

While the geological continuity of this region is, on the whole, very noteworthy, there is a marked break in the topographical features, which causes its northern portion to be known by a separate name from the remainder of the chain. The northern portion forms the *Cheviot Hills*, or at least a great part of them. It is only in the south-west part, however,—the part containing the upper valley of the North Tyne and the Carter Bar, the chief pass across these hills between England and Scotland,—that these strata form the uppermost solid rocks; and it is to be noticed, too, that in the Cheviots

these strata undergo a change in lithological character. It is only in the southern parts that the true Carboniferous Limestone of England is seen. In the north this rock is replaced by what are known as the Calciferous Sandstones—a series in which the prevailing rocks are sandstones of diverse colours with comparatively thin seams of limestone interbedded. In the geological order of succession, however, they appear to correspond to part of the English Carboniferous Limestone series. In the north-east and higher part of the Cheviots, including the Cheviot (2676 feet), the stratified rocks are covered with a large outpouring of volcanic porphyritic¹ rock, and in one place a patch of plutonic² origin has been laid bare by the denuding agents.

The series of high grounds to the south of the Cheviots is known as the *Pennine Chain*, a name in all probability identical with the Pennine Range of the Alps and the Apennines of Italy, all three testifying to the Celtic peoples who first bestowed the names, *pen* being a Celtic root signifying “high.” The line of division between the Cheviots and the Pennines is a narrow depression under 500 feet in height, traversed by the upper valleys of the Tyne and the Irthing, and now also by the railway from Newcastle to Carlisle. Here also ran the wall which, during most of the Roman period, formed the northern limit of Roman dominion in Britain, and remains of which are still to be seen—running, however, a little to the north of the lowest line of depression. Geologically, the whole of this line of depression belongs to the Carboniferous Limestone, but it is overlooked

¹ Porphyritic rock is an igneous rock, in which a matrix has grains of another mineral disseminated through it.

² Plutonic rocks are igneous rocks solidified below the surface of the ground.

on the south by a series of heights of the Millstone Grit series.

Towards the north, about the sources of the Swale and Ure on the one hand, and those of the Eden and Lune on the other hand, the Pennine Chain is connected with another elevated region on the west of different origin. The region referred to is that of the English Lake District,



STRIDING EDGE, HELVELLYN.

occupying the heart of the part of England lying to the north of Morecambe Bay, and jutting out to the west in St. Bee's Head. This group of mountains is composed of the relics of a dome-shaped area, the ridges of which now radiate in all directions and contain the lakes in the intervening valleys. The rocks are mainly ancient stratified rocks of Cambrian or Silurian age, but extensively covered in the northern half with volcanic deposits, a few

plutonic patches being also laid to view. But while such is the formation of the greater part of this area, the member connecting it with the Pennine Chain is a band of Carboniferous Limestone which, after forming the neck or saddle between the two highland areas, sweeps round to the north and west in a sickle-shape, gradually sinking in elevation and terminating about 6 or 7 miles from the coast of Cumberland behind Whitehaven. The neck of Carboniferous Limestone forms Shap Fells, over which the main route from the west to the lowlands in the extreme north-west of England has passed for many centuries, the route leading from the Lune valley to Penrith and the valley of the Petterill, the left bank tributary of the Eden parallel to the main stream. This route is now followed by the London and North-Western Railway, the rails of which attain at the summit of the fells an altitude of 916 feet. The Midland route, to the east of the former, following the valleys of the Ribble and the Eden, passes through about 30 miles of thinly-peopled sheep-walks and moorland in the higher parts of the Carboniferous Limestone area of the Pennine Chain, and attains, in the mile-and-a-half long Blea Moor tunnel to the north of Ingleborough and east of Whernside, in passing from the basin of the Ribble to that of the Lune, an altitude of 1250 feet.

As regards cultivation and the distribution of villages as determined by cultivation, the mere altitude of the Pennine Chain, together with its situation, must always make it a line of division. Lying in the colder latitudes of England, and directly exposed to the south-westerly rain-bearing winds, its surface is both too cold and too moist for arable agriculture, and over large areas its aspect is made even drearier by the nature of the superficial covering. In many parts that covering consists, as

throughout the greater part of England, of boulder clay and other glacial deposits, and where these occur the ground may to a large extent be utilised more or less profitably for sheep-walks. But both on the Cheviots and the Pennine Chain there are vast tracts covered with thick deposits of peat either exposed or covered with heath.

3. The Mineral Wealth on opposite sides of the Pennine Chain

But the Pennine Chain forms an important line of division in another respect. The poverty of the region in an agricultural sense has always been compensated to some extent by its mineral wealth. In earlier times the most important part of this wealth was lead, which has been mined for centuries on both sides of the chain in Durham, Northumberland, Cumberland, and elsewhere, and which, apart from building stone, is still the most important mineral product of the chain itself. But bordering on this chain and the parts geologically connected with it there lie at several places both on the east and west the coalfields which form the most important part of the mineral wealth of England at the present day. In the north-east lies the continuous coalfield of North Durham and the south-east of Northumberland, in the latter county attaining the sea-coast and dipping in places under the sea. In the north-west the end of the sickle-shaped spur of Carboniferous Limestone already referred to is succeeded on the west by another coalfield—that of Whitehaven and Workington—bordering on the sea-coast and passing under the sea. In the south-east is the great coalfield extending from the West Riding of Yorkshire through Derbyshire and Notts to the neigh-

bourhood of Nottingham, becoming narrower on the whole as it passes southwards. In the south-west is the great coalfield of South Lancashire, continued southwards in a narrow strip through the east of Cheshire to Macclesfield, and reappearing after a short break in another expansion in North Staffordshire. The wider expanses of these coalfields in the north are separated from one another by 11 to 18 miles of the Millstone Grit series, while the narrower strips to the south are separated chiefly by the Carboniferous Limestones of North Derbyshire, across which there was, till within the last year or two, no direct railway connection between east and west. This was at last (1894) supplied in the Dore and Chinley line of the Midland Railway passing in a tunnel 3 miles 950 yards long through the Yoredale sandstones of the vale of Edale, just south of the grits of the Peak.

4. The Arable Areas on opposite sides of the Pennine Chain

At the present day, it hardly needs to be mentioned, these coalfields make the regions to which they belong the seat of as dense a population as is to be found anywhere on the face of the globe. But this, except in the case of the north-east or Newcastle coalfield, is a matter of quite recent history. That being so the southern coalfields on the borders of the Pennine Chain contributed to make that tract of uplands down to a comparatively recent date a division not only between east and west, but, in a still more marked degree, a division between the rich and populous region in the south-east of England and the poor and thinly-peopled area in the north-west—poor and thinly-peopled on the whole, even though two of the oldest manufacturing towns of England—Manchester and

Kendal—belong to the area in question. For the soil of the coal-measures is generally infertile, and the coalfield of south Lancashire has hence contributed to narrow still further the extent of good soil between the sea and the uncultivable heights of the Pennine Chain.

A large part of the most fertile soil of Middle England is derived from the weathering of red and other coloured sandstones and marls belonging to the two systems lying geologically next above the coal-measures. It is true that here as elsewhere in England north of the Thames the surface soil is to a large extent a glacial deposit of various origin, but that does not seem to prevent the underlying rock from having an important effect on the composition of the subsoil and the general fertility of the surface. Hence the nature of the underlying rocks is worthy of consideration even where this superficial covering exists.

Now the sandstones and marls above referred to belong to strata that are spread over a wide area of lowlands (under 500 feet in elevation), which begin on the west of the carboniferous high-grounds on the south of Morecambe Bay, pass round the south end of these high grounds, cover a large part of the Midlands, sending out a tongue in the south-west to the Severn below Gloucester, and extend northwards on the east side of the Carboniferous high-grounds through the vale of York to the valley of the lower Tees, where they reach the coast.

From the prevailing character of the rock here developed these strata have sometimes been known collectively as the New Red Sandstone, but the strata belong geologically to two systems, the Permian and the Triassic, both of which reappear in the extreme north-west of England in the fertile valleys of the Eden and its

main tributaries. Of the two systems the Triassic is that which covers by far the greater extent of ground. In both of course the lithological characters vary in different parts. In the Triassic, in addition to the sandstones and marls, there are considerable areas of pebble-beds and other conglomerates, which are by no means so fertile as the other members of the system, but which in places are important as forming excellent sites for towns. The upper member of the Permian is a carbonate of lime and magnesia, hence known as magnesian limestone, which, though covering altogether only a small area in England, is important as yielding a valuable building stone. It occupies a narrow band running northwards from Nottingham to beyond Ripon, and cropping out again north of the Tees fills a wedge between the Durham coalfield and the sea-coast, where it forms a line of cliffs.

On the whole, however, the distribution of the sandstones and marls is economically of most importance in this part of England, and with reference to the history of the country from a very early period special interest attaches to the extent occupied by them on the west side of the Carboniferous high-grounds. And here we must notice more particularly the situation of these high-grounds with reference to the east and west coasts from Morecambe Bay southwards. It will be remembered that the meridian of 2° W. has been chosen as marking roughly the situation of those high-grounds. As a matter of fact, the high-grounds in question are in the north mainly to the west of that meridian, in the south mainly to the east of it, but down nearly to the latitude of Manchester the extent on the west is at least as great as that on the east, if not greater. Now it will be noticed that at this part of England the meridian of 2° W. is itself much nearer the west coast than the east,

but in two parts of Lancashire the high-grounds referred to extend far to the westward of that line. North of Manchester the towns of Bolton, Bury, Heywood, and Rochdale may be taken as marking approximately the limits of the lowlands. They are all on the South Lancashire coalfield, and all below 500 feet—Rochdale, however, not much below that altitude, and from that limit the



INGLEBOROUGH.

ground gradually rises northwards to patches of Millstone Grit above 1000 feet in altitude, separated from one another by the roads (and now also the railways) from Manchester to Blackburn, Accrington, and Burnley, which all lie near the northern limit of the South Lancashire coalfield. This series of high-grounds extends westwards nearly to Chorley.

North of the Ribble, again, an expanse of the Millstone Grit series extends westwards to the shores of

Morecambe Bay. This area has a considerable core above 1500 feet in height, though it has been, for the most part, worn away by feeders of the Ribble and Lune and the headwaters of the Wyre, which drain it to below 1000 feet. Land above 500 feet here extends, however, to within 4 or 5 miles of Lancaster. The area referred to is now girt round by lines of the London and North-Western, Lancashire and Yorkshire, and Midland Railway systems, but is still uncrossed by any railway or any high-road.

The general result is that north of Bolton the width between the sea-coast and the land above 500 feet is mostly less than 10 miles. Moreover, of this width the area fit for cultivation is still further reduced by the nature of the surface. On the sea-coast both north and south of the Ribble there are long stretches of blown sand, forming in places low downs, covered only with coarse grass and utterly useless for agriculture, and driving the villages more or less inland; at Formby Point, the westernmost extremity of South Lancashire, about $2\frac{1}{2}$ miles inland. East of that again, in this latter district, there is a narrow strip covered with peat reaching in places to a depth of 25 feet, and a continuous line of villages (Halsall, Haskayne, Lydiate, Maghull, Sefton, and Orrell) is first met with on a deposit of glacial gravel and sand resting on Triassic (Keuper) formations. Extensive deposits of peat occur also in the Lancashire low-grounds elsewhere, as in the tract between the Wyre and the south shore of Morecambe Bay, and in the celebrated Chat Moss in the south of the county west of Manchester. All such areas could be made fit for cultivation only at great expense, if they could be made so at all, and to these, in considering the likelihood of Lancashire becoming well peopled at an early date, we

must add the relatively infertile soil of the coal-measures. Manchester is just touched by this formation, and its general southern limit lies a little to the north of that latitude. Westwards the coalfield extends to a mile or two beyond St. Helens. Its western limit lies within about 2 miles of Ormskirk and Preston, and its northern limit runs about 2 miles north of the towns already mentioned (Blackburn, Accrington, and Burnley), and extends in the north-east to Colne. West of this coalfield, accordingly, and west of the high-grounds farther north, there is only a very small width indeed occupied by the richer soils of the New Red Sandstone periods unobscured by peat or other later deposits of such a kind as to make the ground practically useless.

It is impossible to devote so much space to our account of the remainder of England, but these details are highly important in enabling us to appreciate the true significance of the Pennine Chain in the geography of England. They make it less surprising that, taken as a whole, the region west of that chain and north of the Mersey has had at different times a different history from the rest of the country. They help us to understand why, down even to the eighteenth century, when the extensive working of the coalfield of South Lancashire for manufacturing purposes first began, this region was, on the whole, a relatively poor and thinly-peopled one, and why, too, Liverpool was so long in attaining a position of eminence among the seaports of England and the world. They serve, too, to bring into stronger relief the greatness of the economic change that has been brought about by the working of this great coalfield, which has not only made South Lancashire one of the most populous districts in the world, but has even enabled this naturally infertile county of Lancaster,

situated on the side of England least suited for the cultivation of corn crops, and where the excessive rainfall due to its situation tends to make it even more unsuited for that industry, has, during the recent decades of depression specially affecting that branch of agriculture, managed to maintain its ground in the cultivation of corn crops in the aggregate better than any other county in England.

CHAPTER V

CENTRAL AND SOUTH-EASTERN ENGLAND

1. The Triassic Areas and their Inliers

IN this part of England the geological structure is perhaps as varied as in the north-west of the country, but there is much more uniformity in the surface features. No point rises to as much as 1500 feet in height, and for the most part the slopes are gentle. The fact that glacial deposits (boulder clay and glacial gravels and sands) are so widespread over the whole of the area north of the Thames and the Bristol Channel modifies to some extent the diversity that might otherwise have been due to the differences in what is known as the solid geology. Still these differences and the slight inequalities in the surface with which they are often directly connected are not without their importance even at the present day, and in some cases have been of greater importance in the past. In unsettled times forests, whether in low-lying tracts difficult to cultivate in consequence of the defect of natural drainage, or on higher grounds often comparatively sterile, were frequently the refuge of robber bands who made the roads dangerous and interfered with the growth of peaceful traffic, and slight eminences had in many cases suffi-

cient natural strength to be made the seat of robber strongholds.

In the last chapter it was said that the Carboniferous rocks in the north of England are girt in the south by strata chiefly composed of red and other coloured sandstones yielding a fertile soil. The rocks referred to are mainly of the Triassic period, and embrace, besides the west and extreme south of Lancashire, the whole of Cheshire, except the part belonging to the coal-measures and Millstone Grits in the east, North and East Shropshire, the greater part of Staffordshire, large parts of the counties of Worcester and Warwick, as well as a portion of the north-west of Gloucestershire, the south of Derbyshire, the west of Leicestershire, the greater part of the county of Nottingham, and the middle or principal lowland tract of Yorkshire. The Triassic rocks are in two series, the Bunter (the lower) and the Keuper, but in both series sandstones or marls yielding a fertile soil predominate. The middle member of the lower series, however, is known as the Bunter Pebble Beds, composed very largely, as the name indicates, of conglomerates, and yielding for the most part an inferior soil. The extent of these beds, however, is in most parts limited. In the west they occur in many places in narrow bands, the firm surface of which has often been utilised as a foundation for towns and villages adjoining rocks of a different kind. But there is one place in the east where these beds form a feature of some importance. They form the height on which the Castle of Nottingham stands, and from this point they spread out northwards, mostly at a relatively high though still moderate elevation, covered only with a poor gravelly and sandy soil, and hence even to this day only thinly peopled. This is the tract which embraces Sherwood and Mansfield

Forests and Robin Hood's Hills, and part of which, from the number of ducal seats it contains, is known as the Dukeries.

On its west margin the New Red Sandstone area of Middle England has several coalfields extending from North Wales to the north-west of Worcestershire, and it completely surrounds three others—that of South



NOTTINGHAM CASTLE.

Frith, photo.

Staffordshire and North Worcestershire, that of East Warwickshire, and that of North-west Leicestershire and South Derbyshire. Another important inlier is formed by a patch of Archæan and Cambrian, associated with igneous rocks between Leicester, Loughborough, and Ashby-de-la-Zouch. These form *Charnwood Forest* (with Bardon Hill rising to an altitude of 912 feet), and include also the hornblendic granite of Mountsorrel, a

castle crowning which remained a robber stronghold till 1217. Quartzites of Cambrian and later age, along with Permian breccias, etc., form the Lickey and Clent Hills between Kidderminster and Birmingham, at the south margin of the westernmost of the three inlying coal-fields.

2. The Jurassic Areas

Immediately to the east of the Triassic rocks of England lie those of the Jurassic system, which is also divided into two series. In this case the series differ markedly from one another in their general lithological character. The lower series forms the Lias, and consists principally of clays and shales, which being generally soft in texture and easily washed away, have formed for the most part extensive plains and vales. They extend from the head of the estuary of the Severn to the south of that of the Tees, winding in the form of a bow through the midland counties, where they spread out to their greatest width, about 20 miles. The soil is in many places heavy, but the middle member of the series, known as the marlstone, yields a soil of exceptional fertility. It forms the rich red soil of the vale of Catmoss, to which the county of Rutland ("red land") is said to owe its name, and farther south-west, in Oxfordshire, Bucks, and Gloucestershire, its fertility is indicated by the exceptional number of villages scattered over its surface. In some places this marlstone appears in the form of hard rock, which on the east margin of the series is directly associated with the rocks of the next series, the Oolites, to form hills overlooking the Liassic plains.

The Oolites ("egg-stones") take their name from their prevailing rocks, limestones of finer or coarser grain, the

grains being of a rounded form, so that their appearance in the mass is somewhat like that of the roe of a fish. They extend nearly continuously in a band varying much in width from the east side of the Devon and Dorset Bay (Portland Bill) to the coast of Yorkshire. They are much more varied in structure than the Lias, but their characteristic limestones are in many places conspicuous by the well-marked escarpments overlooking the plains or valleys beneath. In the Cotswold, including the Leckhampton Hills east of the Severn, we have an example of such an escarpment, in which the inferior or, farther back, the Great Oolite forms the top, while the Liassic marlstone appears on the side or at a lower step, and Lower Lias clay forms the plain beneath. In the north of Oxfordshire, again, the Inferior Oolite forms an escarpment which is continued into Warwickshire by the marlstone forming the top of Edge Hill, the lower slope of which is formed by Middle Lias marls and the base by Middle Lias clays. In Northamptonshire Oolitic escarpments are seen in various places, especially in the extreme north-west close to the right bank of the Welland; but a much better marked or at least more continuous escarpment of this series is seen in Lincolnshire, where the western edge of the Oolites forms a nearly straight line running from south to north about the meridian of Lincoln, forming the High Dyke on Lincoln Heights. South of the city of Lincoln the Great Northern line from Grantham runs close along the base of this escarpment. Both north and south of Lincoln its western edge is accurately marked by a close-set line of villages beginning with Carlton Scroop, about 6 miles north of Grantham, and terminating at Whitton-on-the-Humber, situated at the distance of almost half-a-mile to two miles from the old Roman road known as Ermine Street, which

runs along the top of this line of heights. The city of Lincoln occupies a break in this line where the river Witham, which from Grantham northwards runs to the west of the Oolites, pierces this series before winding south-east through a plain of its own alluvium to the Wash.

In the south-east of Yorkshire there is only a small patch of this series, the north-west base of which is marked by the village of St. Cave, but in the north-east of this county they spread out over the greater part of the area and, along with various members of the Lias, form the Yorkshire moors, including the *Cleveland Hills* and the *Hambleton Hills*. These moors comprise the only tract in the south-east section of England above 1000 feet in height. Their highest point, Burton Howe or Burton Head, 14 miles south-east of Middlesbrough, is just under 1500 feet (1489 feet). The scenery of the region is very varied. The *Hambleton Hills*, which form the western border of the southern part of this tract, and are composed chiefly of limestones belonging to the Inferior or Middle Oolites, presenting a steep escarpment to the west, is (according to Arthur Young) not called Black for nothing, being a continued ridge of black moors 11 to 12 miles in length by 4 to 8 miles in width.¹ The still higher moorlands of the Cleveland "cliff-land") Hills in the north are equally desolate, but there are numerous beautiful and sheltered narrow valleys, some drained south and some north, a few of which contained at an early date monasteries and nunneries (Rievaulx, Rosedale, Keldale, etc.). Even the valleys, however, nowadays contain only a very scanty population except in their lower parts, and the whole region was one of the most sparsely-peopled tracts of

¹ *Tour in the Northern Counties*, vol. ii. pp. 88, 89.

England until the ironstone, which is met with in great abundance in thin bands and nodules in shales belonging to the Middle Lias, came to be worked in the present century. Now the northern part of this tract belongs to the busiest iron and steel working district in England, and one of the busiest in the world.

The subdivisions of the Oolite are very numerous, and the soils which they yield very varied in character. The limestones which are found in all the leading divisions generally yield a thin soil, especially on the higher grounds, where in places they are only suitable for sheep-walks, as in the Cotswold Hills, and in other places, as in the north half of Northamptonshire, they are still to a considerable extent covered with remains of ancient forests. The higher parts of the series in Lincolnshire also have only a thin sprinkling of villages on them. Among the more important of the other members of the series is the Fuller's Earth, which lies between the Inferior and the Great Oolitic Limestones, and is important on account of the fine earth it yields for the scouring of wool, but generally forms a heavy and wet soil. In Middle England the Northampton sands generally form a rich soil, and are still more important on account of the abundance of iron-ore obtained from them. In Middle England, especially to the south-west of the region of the Northampton sands, the Oxford clay is a very widespread member of the Middle Oolites. This is a very dense deposit, impermeable to water, which must be sought for below, expensive to work with the plough, and hence was mostly in permanent pasture even at a time when arable land was much more extensive in England than it is now. There are, consequently, comparatively few villages on this zone except near its margin, and especially in the western parts of its area—in Oxford-

shire itself and the east of Gloucestershire. The Cornbrash yields the most fertile soil of the Great Oolite division of the series, more particularly where it occurs in the south-west of England, and owes its name to that part, but it is nowhere very widely distributed. In Somerset and Dorsetshire a line of villages,—Wincanton, North and South Cheriton, Templecombe, Yeanston, Henstridge, Stalbridge, and Stourton and Bishop's Caundle, —lying close together in that order from north to south, marks the presence of this formation.

3. The Chalk

The next system to the east is the Cretaceous, which is divided into two series, the Upper and the Lower, the Upper containing the most extensively developed of all the members of the system, namely, the Chalk, to which the whole system owes its name. As is well known, this rock is a soft but fine-grained form of carbonate of lime, composed of the remains of minute and indeed microscopic deep-sea organisms, enclosing in some places layers of scattered flints, which are no doubt derived from the solution and deposition of the skeletons of siliceous organisms. The "chalk with flints" is for the most part in the geological order of succession a lower zone than the chalk without flints, but this is not a uniform distinction.

No formation with such uniform lithological characters easily recognised by non-geologists is so widely distributed in England. Its chief place of occurrence is the south-east between the Wash and Weymouth Bay, a region in which it occupies in the aggregate about one-half the surface. It reappears over a considerable extent in the north-east of Lincolnshire and the south-east of Yorkshire.

In the south-eastern region it appears in the form of four offshoots varying greatly in length and width, starting from a common root or centre in Wilts and the north of Hampshire. The longest and broadest of these offshoots runs north-eastwards to the north coast of Norfolk, where it forms a straight line immediately behind the alluvium of all that part of the coast that runs nearly due east from Hunstanton Point (to



SHAKESPEARE'S CLIFF, DOVER.

Weybourne). The offshoot next in length proceeds eastwards with a slight curve to the north through Surrey and North Kent, and ends in sea-cliffs between Deal and Folkestone. An outlying patch belonging to this branch forms the greater part of the Isle of Thanet. The third, which is the next in length, branches off the main trunk in Hampshire in the neighbourhood of Petersfield, and runs east-south-east to the cliffs of Beachy Head, the south side of this branch forming the whole coast-line

(apart from recent superficial deposits) as far west as Littlehampton. The fourth offshoot runs south-west through Dorsetshire to the coast east of Melcombe Regis, and sends off eastwards through the Isle of Purbeck a thin branch, which reappears in the thin band of Chalk that runs through the middle of the Isle of Wight from the Needles to Culver Cliff. An outlier of this



THE NEEDLES.

chalk is exposed in the horseshoe-shaped downs in the south of the island behind Ventnor, and smaller patches appear farther west.

Owing to its structure and its situation with regard to other formations, the chalk generally has a marked effect on the surface features of the country, the disposition of towns and villages, and in many places also on the agriculture. The surface features due to the chalk are

nearly everywhere gentle in outline but quite distinctive. Though soft as a rock it is generally of a firmer texture and less liable to erosion by water than the rocks immediately adjoining, belonging for the most part either to the inferior members of the Cretaceous system (Upper Greensand, Gault, Lower Greensand, etc.) or to later (Tertiary) formations. The chalk accordingly in most places forms relatively high ground and sinks down more or less gradually to the surfaces formed by adjoining formations. The nature of the slope, however, is determined by the general character of the chalk itself. Being soft its superficial erosion is easy compared with that of most solid rocks. Moreover, like other limestones, it is slowly soluble in rain-water, and being highly porous and absorbent, it is liable to this form of erosion not merely, like the harder limestones, along cracks and in cavities in which the rain-water is retained in greater or less quantity, but uniformly over the whole surface as far as the rain-water penetrates. The erosion of the chalk is hence fairly equal over the whole surface, and its slopes are for the most part gentle, hardly anywhere so steep that they cannot be ascended on foot.

Where the width of chalk is narrow it slopes down on both sides, forming a well-marked ridge. The most conspicuous example of this kind is presented by what is known as the *Hog's Back*, the ridge in West Surrey that runs due east and west for eight miles between Guildford and Farnham, with an average width of half a mile or less. Where the chalk is of considerable width the general surface is either nearly level or presents a gentle slope in one direction, but a steeper escarpment in the other direction. The general surface in such cases is streaked with shallow furrows containing in many cases tiny streams at their bottom. Among examples of this

kind are the *North Downs*, which form a direct continuation of the Hog's Back in Surrey and North Kent, and which slope rather steeply down on the south side to what is known as the Weald; the *South Downs*, which similarly slope steeply down on the north side to the same area, but in some places are narrow enough to form a well-marked ridge; the *Isley* and *Lambourn Downs* running westwards from the Thames above Reading, the latter having marked out on its side the "white horse," which gives the name of White Horse Vale to the valley of the Ock on the north; the higher escarpment, which forms, under the name of the *Chiltern Hills*, a continuation of this ridge east of the Thames, running north-eastwards from the place where the Thames dips southwards between Oxford and Reading; and the escarpment known as the *East Anglian Heights*, facing westwards, in the eastern countries of England. In Lincolnshire the chalk has a sufficiently well-marked slope both on the east and west, but on the east side the harder upper beds of chalk—those forming the *Lincolnshire Wolds*—slope down to softer beds beneath. In Yorkshire again the higher beds of chalk forming the *Yorkshire Wolds* not only slope somewhat steeply down to adjoining rocks of a different nature on the west and north, but also on the east and south to the level beds of chalk which underlie the boulder clay of the peninsula of Holderness. In the north these Wolds, though little above 500 feet in height, present a feature all the more striking on account of the nature of the surface by which they are separated from the Oolitic high-grounds (the Yorkshire Moors), which face them on the other side of the Vale of Pickering (Ryedale and Derwent-dale). From Helmsley and Gilling in the west to within 2 or 3 miles of Filey in the east there stretches an alluvial plain largely covered with blown

sand, 30 miles in length, with a width of 1 to 9 miles. The north margin of this plain is marked by a line of villages, including Kirkby Moorside and Pickering, mostly standing on members of the Middle and Upper Oolite. On the south margin west of Malton the villages stand on the Oolites which lie at the base of the Liassic heights forming the Howardian Hills (580 feet); but east of Malton the north base of the chalk, which is here much disturbed by landslips and generally descends steeply to the flat alluvial plain, is accurately marked by the close-set line of villages on the road (a little south of the railway) from Malton to Filey. On the coast these chalk heights stand out in bold cliffs at and near Flamborough Head.

From its absorbent nature the chalk always contains much water, but does not give it out freely. Still, water is always to be found in sufficient plenty at the bottom of the furrows already mentioned, as forming characteristic streaks on the surface of the chalk. In these furrows, accordingly, are generally to be found the villages of the more extensive chalk areas, and the chief lines of communication across the chalk. In the neighbourhood of London, for example, such lines of villages are marked out by the course of the Gade with the villages of Hemel Hempstead, Bulbourne, and the town of Great Berkhamstead, a route now partly followed by the London and North-Western Railway; the Chess, with the villages of Chesham, Flaunden, and Rickmansworth; the Misbourne, with Great and Little Missenden, Amersham, Chalfont St. Giles and St. Peter, and Denham, a route partly followed by the Aylesbury branch of the Metropolitan Railway; and the Rye with West Wycombe, High Wycombe, and Woburn, on the Great Western Railway. More important towns are

sometimes met with in well-marked hollows at the meeting-place of such shallow furrows. Such, for example, are Hitchin in Herts, and Royston on the Herts border of Cambridgeshire, both on the old way known as Icknield Street. On some of the broader expanses of chalk comparatively free from superficial covering, as in the north of Hampshire, on *Salisbury Plain*, in Wiltshire, and in Dorsetshire, there are some lines of road running from town to town along the higher parts of the chalk without villages, and others through close-set strings of villages in the furrows. And with reference to communication, it is worthy of note that chalk downs form so good a foundation for roads that mere tracks worn by the passage of vehicles are in many places even more convenient for traffic than regularly-made, but ill-kept, roads on soils of another kind. Such, no doubt, is the origin of the Icknield Way, which not only runs south-west along the Chilterns, but is also continued westwards on the other side of the Thames, along the top of the Ilsley and Lambourn Downs.

For the same reason that lines of villages are to be found on the furrows that seam the chalk, they are frequently to be found in strings at the base of the chalk. In many places these lie on the Upper Greensand, the next zone below the chalk. The zone is not met with over a large area, but it forms many long and narrow strips at the base of the chalk, and being for the most part a water-bearing formation, and in some places yielding a very fertile soil, it is often crowded with villages. In the Wiltshire area it is marked more or less by a string of villages passing round the chalk from Baverstock, north-west of Salisbury in the south, to Compton Beauchamp in the north (in West Berkshire between Wantage and Swindon), as well as in a wedge

which runs eastwards from Devizes nearly to the east border of the county, along the route of the Great Western line to Hungerford. Numerous villages are also to be found on the Upper Greensand in the Weald, which is separately described below. In the west, however, in Somerset and Devon, the Upper Greensand, it may here be mentioned, forms somewhat barren high-grounds (the Blackdown Hills), the villages here being in valleys, filled with New Red Marl.

It is a notable feature of the North and South Downs that they are both cut through by the rivers draining the area between the two, and some of the more important towns at the base of the chalk lie at or near the points where these valleys afford the easiest lines of communication across the Downs. At the west end of the Hog's Back the town of Farnham lies in a hollow close to a well-marked breach, through which now runs the London and South-Western Railway. Here the Wey comes within about 2 miles of the Blackwater, and between the two is a small fault, which has probably helped to form the depression. Possibly the Blackwater has flowed through this depression at some period, but if so its headwater has been tapped by the Wey working its head back along the softer beds to the south of the chalk. At the east end of the Hog's Back the Wey, after curving to the south and winding through the sandy Folkestone Beds of the Lower Greensand, crosses the chalk on its northerly course to the Thames, and at the crossing-place stands Guildford, in a depression indeed, but still mainly on a chalk foundation. Eleven miles in a direct line farther east the Mole similarly breaks through the Downs, and at this opening stands Dorking, mainly on the Folkestone Beds to the south of the chalk. About 7 miles farther east the southern

escarpment of the chalk begins to trend north-eastwards to the mouth of one of the deepest of those riverless furrows to be found in the chalk, the furrow leading by Merstham and Chipstead to Croydon, now followed by the Brighton line from London Bridge, and possibly at one time, as suggested by Mackinder,¹ traversed by a stream now captured by the Mole. Just below the point where the north-easterly trend of the chalk begins stands Reigate (that is, "ridgeway"), the village of Merstham lying on the Upper Greensand accurately at the mouth of the furrow, but off the course of the east and west road from Farnham to Maidstone. Still farther east the North Downs are traversed by the Darent, the Medway, and the Stour, towards which the chalk slopes down on both sides, and at or near the southern entrance to the furrows formed by these rivers stand Sevenoaks, Maidstone, and Ashford, while at the northern margin of the chalk valley of the Stour, on an expansion of river gravel, stands the city of Canterbury.

The South Downs,² again, are pierced in the order from west to east by the Lavant, the Arun, the Adur, and the Ouse, the valleys of which are respectively marked by the towns of Chichester, Arundel, New Shoreham, and Lewes—the first two near the south margin of the chalk, New Shoreham on the coast, and Lewes partly in a narrow strait between two chalk cliffs formed by the main ridge of the Downs, where they are pierced by the Ouse, and partly on the westernmost of the two cliffs, just above a fan-shaped expansion of alluvium which here covers the plain beneath.

¹ *Britain and the British Seas*, p. 117.

² See the interesting and valuable account of a portion of this region by Dr. H. R. Mill, under the title of "A Fragment of the Geography of England: South-West Sussex," in the *Geol. Journ.* vol. xv.

With regard to agriculture the general characteristics of the chalk are a good deal modified by the large extent of their superficial, so-called drift, coverings. North of the Thames these coverings consist mainly of boulder-clay and glacial gravel and sands, and it is in consequence of these coverings, as well as the lime supplied by the underlying chalk, that the chalk areas in the eastern counties south of the Wash possess the fertility for which they have long been noted. In the neighbourhood (north-west) of London and south of the Thames, in parts of Hampshire, and in the North Downs these give place to irregular patches of loams, brick-earths, and clay with flints, which often afford a considerable depth of soil suitable for tillage; but where the chalk is exposed on the surface, as on a large part of Wilts, Dorset, Hampshire, and the South Downs, there is generally only a thin soil producing little but short grass adapted only for sheep-rearing.

While the alluvial flats of the South Downs are of the small value above indicated, the drift-covered plains to the south of the Downs are exceptionally well cultivated, and appear to have been so from Roman times downwards. Especially productive are the rich dark chocolate-coloured soils in the neighbourhood of Worthing, which in recent years have been largely devoted to the cultivation of large and small fruit under the shelter of euonymus and other hedges or rows of poplars.

The alluvium bordering the rivers mentioned as flowing through the South Downs is generally too level to allow of adequate drainage, and is hence suited only for inferior pastures. This is particularly the case with the alluvium bordering the windings of the Arun, to the south of the Rother, a soft moist tract remaining flooded for days after heavy rains, without cultivation, without dwellings, covered only with rank and coarse

pastures on which graze shaggy-coated cattle. No road follows this valley, which is nevertheless one of the openings of which the railway has taken advantage in this region, the absence of gradient compensating the necessity of making a firm foundation. East and west of this valley the parallel valleys of the Adur, the Ouse, and the Lavant, as well as a dry valley



THE ARUN AT ARUNDEL.

to the north of Brighton, are made use of by the London, Brighton, and South Coast Railway to cross the South Downs wholly or partly from different places on the south coast, and west of all these a similar valley, partly drained by the Havant stream, is made use of by the London and South-Western line from Portsmouth to London, which finally pierces the main ridge of the South Downs in a tunnel about 2 miles to the east of Butser Hill.

4. The Weald

The Weald is the area containing the greater part of the Cretaceous formations below the chalk met with in England. It forms a wedge between the North and South Downs and the Hampshire portion of the central core of chalk, and has its apex near Petersfield and its base on the coast from Eastbourne to Folkestone, except where it is interrupted by the alluvial deposits terminating at Dungeness. This area is so important with reference to the early history of England, that it is necessary to subject it to a somewhat detailed examination; and as this importance is intimately connected with the details of the geological composition of the area, a table showing the geological succession of the zones is here given, the uppermost being placed at the top and the lowest at the bottom :—

Upper Cretaceous	{ Upper Greensand.	
	{ Gault.	
Lower Cretaceous	{ Lower Greensand	{ Folkestone Beds.
		{ Sandgate Beds.
	{ Wealden Series	{ Hythe Beds.
		{ Atherfield Clay.
		{ Weald Clay.
		{ Hastings Beds.

As they appear on the surface the Hastings Beds form the innermost member of the series, occupying a wedge having its apex near Horsham, while its base rests on the sea between Pevensey Level and the alluvium south-west of Rye, its inland limit being formed by that and the adjacent alluvium of Romney Marsh. It is of considerable extent, succeeded externally by zones of the other members of the series forming forks, with the prongs on the north and south, the apex in the west, towards the apex of the whole area to which they belong.

The Hastings Beds are also known locally as the Tunbridge Sands, and the towns from which the two names are derived indicate approximately the limits of the deposit on the south-east and north-west. The longer axis extends from east to west through Ashdown and St. Leonard's Forests. These beds are composed chiefly of a very fine sand, but largely of clays, known as Wadhurst Clay and sometimes locally as East Grinstead Clay. They rise everywhere gently from underneath the plain formed by the Weald Clay, and attain a considerable average elevation (highest point, *Crowborough Beacon*, 796 feet). The sands are for the most part far from fertile, no doubt because of their porosity and the readiness with which such a soil at a relatively high elevation loses its moisture. In early times the whole area was covered with forest, and the barrenness of the soil would stand in the way of its being cleared. The names Ashdown Forest and St. Leonard's Forest are indicative of this former condition of things, and the latter name is still to a large extent appropriate. Over a large area the clearing of these forests was due not to cultivation but to the using up of the timber in smelting the ironstone, which is extensively distributed in this formation, and for a long period was the most important mineral deposit of the south-east of England. It occurs chiefly in the form of nodules and thin beds in the Wadhurst Clay in East Sussex and the west of Kent, where it is known to have been worked in several places by the Romans. It continued to be worked down to the early part of the nineteenth century, and the industry finally died out, not from want of ore, but from lack of fuel, or rather from the relative dearness of the fuel once the method of using coal in the smelting of iron-ore had been learnt. (See below, pp. 313, 314).

The area just outside the Hastings Beds has already been referred to as a plain. Such is indeed the general character of the Weald Clay, which forms a fork with prongs on the north and south of the Hastings Beds, with a wide expansion at the origin of the prongs extending westwards to the base of Hindhead Common. The stiff yellowish clay of which the area in question is mainly composed forms a nearly flat surface in which the rivers occupy forced shallow alluvial valleys much subject to inundation—such, for example, as the valley of the Teise, a right bank tributary of the Medway, which it enters from the south-east between Tonbridge and Maidstone. The soil is difficult to cultivate, and in former times this tract also was undoubtedly included in the forest area from which the Weald ("forest") takes its name. The surface is not, however, wholly flat. Here and there are slight eminences due to the presence of shelly remains of species of *Paludina*. Such, for instance, is the slight eminence seen at the distance of 5 or 6 miles in looking due east from Leith Hill. More important deposits of this nature elsewhere have hardened into a rock, which has been worked under the name of Sussex marble, sometimes known also as Petworth marble, from the Sussex town of that name, and sometimes also as Bethersden marble, from a village in Kent a few miles west of Ashford. Economically these deposits are of no little importance for the district, inasmuch as they have been utilised among other purposes as road-metal for the side footpaths which, in former times, before the improvement of communications generally cheapened the carriage of road-metal, formed in winter the only means of communication across the Weald Clay, the roads themselves being in wet weather almost impassable.

The Atherfield Clay, which is similar in composition to the Weald Clay, and forms a very narrow and not continuous external fringe to it, is physically merged in the same plain; but the other members of the Lower Greensand rise to considerable heights, on the one hand, from the inner plain of the Weald Clay, and, on the other hand, from the outer and narrower plain of the



HINDHEAD.

Frith, photo.

Gault, which is mainly composed of a blue or black clay. The most notable eminences of the Lower Greensand are *Leith Hill* (967 feet) and *Hindhead* (894 feet), between which lie the high-grounds of *Hurtwood Common*, *Highdown Heath*, *Witley Common*, and *Thursley Common*.

Economically the Folkestone Beds are the least fertile, and the Hythe Beds are the most fertile, as well as in other respects the most important subdivision of

the Lower Greensand. The Folkestone Beds always yield a light loose soil, which in the higher grounds is almost everywhere left in the condition of commons. Some of the commons above mentioned are more or less covered by this deposit, and to it belong also Crooksbury, Farnham, Frensham, and other commons to the south and south-west of the Hog's Back.

The Hythe Beds, which are the most extensively developed of all the members of the Lower Greensand, are much more variable in character, and yield some of the most fertile soils of Kent. In that county they are composed of beds of limestone, known as Kentish Rag, calcareous sand, and soft sandstone. It is on the soils overlying the ragstone that the best of the Kentish hop-gardens are found—those in the valley of the Medway round Maidstone. The soil, which is stony, containing fragments of the rag with pieces of chert here and there, is highly porous, but the Atherfield Clay in many places attains importance as a subjacent layer preventing the moisture from draining away. Besides hops, the ragstone of Kent bears on its surface some of the best orchards of the county.

As already indicated, the Gault is a clay plain. Outside of that the Upper Greensand appears generally only as a narrow strip on the inner escarpment or at the base of the chalk. It is, however, important on account of its fertility, being in the Weald rich in soluble silica, and bearing excellent wheat and hops. The hop-grounds of Farnham, which yield the finest hops in England, if not in the world, lie mainly upon this soil, on which hops have here been continuously cultivated for more than three hundred years.

In the memoirs on the geology of the Weald by William Topley many interesting particulars are given

with respect to the distribution of towns and villages and the arrangement of parishes in this district. The occurrence of villages at the base of the chalk has already been referred to. According to Topley, of the 397 towns and villages in the Weald 73, or 18 per cent, lie either at the foot of the chalk or on the Upper Greensand terrace; 13 villages in Kent occur in a similar situation on the face of the Lower Greensand escarpment at or near the junction of the Weald Clay; in all, 98 towns and villages occur on the Lower Greensand plateau, most of them on the lighter soils, and 97 towns and villages in the Hastings Beds, 79 of them on sandy sites. There are few towns of any size on the Weald Clay, the largest being Hailsham, and there are no large towns on the Hastings Beds, except Tunbridge Wells and Hastings.

The total number of parishes round the chalk escarpment is 125, and of these 119 have the village situated at the foot of the hill, with one strip of the parish running up the escarpment and another running in the other direction across the Gault into the Lower Greensand, and, if the outcrop of this bed is narrow, across it to the Weald Clay. If the Lower Greensand has considerable width, the parishes having their boundaries on it there meet other parishes, the villages belonging to which are situated upon the top of the Lower Greensand plateau.

This arrangement probably arises from the fact that the former parishes were the first settled, the villages being formed close to the fertile arable soil; while to each of them was assigned a strip of pasture land on the chalk and a strip of woodland on the other side. Though the Lower Greensand may have been covered in prehistoric times with forest, it was probably cleared at

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a very early date, and on it, no doubt, was formed the next series of settlements, whose parishes run outwards to the boundaries of those whose villages are at or near the base of the chalk.

5. Cretaceous Areas outside of the Chalk and the Weald

Outside of the Weald it is mainly members of the Lower Greensand that have been exposed by denudation in the fertile undulating tract between the chalk downs in the middle and south of the island. Elsewhere the members of the Cretaceous system below the chalk mainly appear as a comparatively narrow belt here and there on the west of the chalk. The outlying high-grounds of the Upper Greensand have already been mentioned (pp. 104, 105). In the midland counties it is chiefly Gault and Lower Greensand that are met with. In the north-west of Norfolk east of the Wash the line of villages from Castle Rising to Heacham lies on an outcrop of Carstone sand—a formation regarded as equivalent to some parts of the Lower Greensand. In Lincolnshire a line of villages winding on the whole south-south-east from South Ferriby west of Barton-on-the-Humber to the neighbourhood of Market Rasen, marks the base of a chalk escarpment, where that rock is bordered west by narrow strips of Tealby Clay, and in the south also by Tealby limestone, formations also equivalent to some part of the Lower Greensand—important as here being associated with bands of ironstone, which have been worked at Claxby and Nettleton.

6. The Tertiary Areas

The Tertiary rocks, or those next above the chalk, are represented in England only by two series—the Eocene

(including the Oligocene) and the Pliocene. The former, the Eocene, are the most abundant, and occur in two wedges between offshoots of the chalk. The larger of those wedges is acute-angled, and lies to the north of the Hampshire chalk and the North Downs, its apex being high up the Thames basin a little to the south of Hungerford. It has numerous small outliers scattered amongst the chalk to the north. The other is an obtuse-angled wedge lying between the Dorsetshire chalk and the South Downs, and includes the portion of the Isle of Wight lying north of the middle line of chalk downs. The mainland portion in the east surrounds an outlier of chalk lying north of Portsmouth harbour and the inlets to the east. The whole area in both sections consists of plains or gently undulating low grounds.

The Eocene deposits are composed of three subdivisions, the Lower, Middle, and Upper, the first of which occupy by far the larger area. Of the Lower Eocene deposits the London Clay, a very stiff tenacious clay impervious to water, is the chief component. These qualities make it, where formed on the surface, heavy and difficult to work, and likewise unsuitable for building sites from the absence of water. It is, however, covered to a large extent with recent deposits of another kind, in some places with recent river gravels and gravels of unknown date, and, north of the Thames, very largely with boulder-clay and glacial gravel and sand. The difficulty of obtaining water retarded the spread of London northwards over the London Clay and boulder clay in the direction of Islington, Highbury, etc., until water was conveyed there by pipes, while sands and gravels in the north-west allowed of an early extension of the suburbs towards Hampstead. Westwards from St. Paul's a deposit of valley gravel and sand fills the entire

loop north of the Thames as high as Windsor, and occupies also a considerable area south of the Thames, including a narrow strip running eastwards to Greenwich.

Below the London Clay are what are known as the Lower London Tertiaries, the principal members of which are the Oldhaven Beds, composed of flint-pebbles, here and there cemented into a pudding-stone rock, or of sharp quartzose sands, and underneath these the Woolwich and Reading Beds, composed of plastic clays, loams, and sandy clays, together with beds of the same composition as the characteristic Oldhaven Beds. The former are in some cases met with in valleys running through the London Clay, in which they serve as a foundation for villages.

The Middle Eocene deposits are composed chiefly of sands and sandy clays or pure clays, the clayey deposits being found in the middle members—the Burton Clay and the Bracklesham Beds. A small patch of the Bagshot Sands is found on the top of Hampstead Heath, but in the northern wedge of Tertiaries their chief area is a patch between Reading and Windsor on the north-west and the Hog's Back on the south. They are spread over a much larger area in the southern or Hampshire wedge, where the London Tertiaries form only a comparatively narrow external band. The western nearly uninhabited shore of Southampton Water¹ is composed of Barton Clay and alluvium, while the numerous villages in the eastern shore rest on the Bracklesham Beds. In the Isle of Wight and the south-west of Hampshire, including part of the New Forest, are some fluvio-marine deposits forming the Upper Eocene.

Over a considerable area to the west and south of the

¹ See T. W. Shore, "Hampshire Midlands," in *Papers and Proc. of the Hampshire Field Club*, March 1893.

present Eocene deposits are found scattered relics of the sandy beds of this series in the form of irregular masses of a hard and rather coarse sandstone known as "grey-wethers" (from their likeness to sheep resting on the ground), or Sarsden or Sarsen stones. They are mostly met with over the chalk in Wiltshire and Hampshire—in some cases in the position in which they have been left by the removal of surrounding material, in other cases in positions to which they have been transported by the agents of denudation. They are to be seen in considerable numbers on the downs west of Marlborough, and they are archæologically interesting as having been used in the erection of the Avebury ring, the outer ring at Stonehenge, and other ancient remains.

The Pliocene or later series of Tertiary rocks occurring in the south-east of England are spread over the maritime tract between the Stour in Essex and the north coast of Norfolk, their inner boundary (where they abut on the Chalk) being approximately marked by the position of Hadleigh, Framlingham, Bungay, Norwich, Aylsham, and the coast village of Weybourne. They are composed of the Coralline Crag, the Red Crag, the Norwich Crag series, and the Cromer Forest Bed series, in the order from the bottom upwards. As now exposed on the surface approximately the same order is observed in going from south to north. Like the adjoining chalk they are in a large measure covered with later glacial deposits, the Pliocene deposits being exposed chiefly near the coast and on the sides of the valleys. Some of the lower parts are completely buried under alluvium. The Coralline Crag is met with most abundantly south of the Alde. One of the most important deposits of this zone is what is known as the Suffolk Bone Bed, so called on account of the abundance of osseous remains in the form

of phosphatic nodules or coprolites, which were formerly dug for manure. This bed attains its greatest importance in the tract north of the estuary of the Deben, a district which, it may be observed, was remarked upon by Arthur Young on account of its exceptional fertility.¹

The Red Crag is associated with the Coralline Crag in the district just mentioned, and abounds to the north, while the prevailing Pliocene deposits in Norfolk are those of the Norwich Crag series. In the part of the county that now forms the eastern half of the northern parliamentary division and the whole of the eastern division, the members of this series are for the most part covered with glacial loams, gravel, and sand, and appear themselves to rest on the Chalk, which is exposed in some of the valleys. It is probably in consequence of this that, as Arthur Young says, the great felicity of the sundry parts of Norfolk is, that dig where you will you find an exceedingly fine marl or clay,²—the marl no doubt due to the chalk, the clay to alluvial deposits.

The extent of the alluvial deposits is a marked feature of the physical geography of this region, in which great quantities of soft materials easily washed away by rain and streamlets not only from the recent Pliocene deposits but also from the glacial covering of the chalk behind, appear to have been deposited on a plain, which may have been submarine within the historical period. The

¹ *Tour in the Eastern Counties*, vol. ii. p. 174. The parishes here mentioned by Young as famous for their husbandry are Eyke, Wantesden, Bromeswell, Sutton, Shottisham, Ramsholt, Alderton, and Bawdsey. Of these Eyke has its village on boulder clay, while Red Crag adjoins on the west, Bromeswell and Alderton lie on the Red Crag, Sutton and Bawdsey on Red Crag and phosphate rock, Shottisham entirely on phosphate rock, and Ramsholt on Red Crag and glacial gravel. A good deal of phosphate or Red Crag lies also on the opposite bank of the Deben.

² *Tour in the Eastern Counties*, vol. ii. p. 152.

tract of more solid land on the coast between the Yare, the Waveney, and Lowestoft harbour is an island covered with boulder clay, and glacial and post-glacial gravel and sand, surrounded by a wide expanse of alluvium. A similar island lies to the north between the Bure and the Hundred Stream. In Suffolk, Dunwich is at the north end of a patch chiefly of Red Crag, sand, and gravel, extending 2 miles along the coast; Southwold, on an island wedge of pebble gravel of uncertain age enclosed by alluvium where not washed by the sea.

South and west of the Wash, bordering on the Chalk and the Oolites, lies the most extensive tract of alluvium in England, forming what is known as the Fen country. It extends up the Witham nearly to Lincoln, and elsewhere its margin is approximately marked by the towns of Bourn, Market Deeping, Peterborough, and Ramsey. In the south-east it extends to within a few miles of Cambridge (Waterbeach). For the most part it is composed of silt and clay, but a considerable width on the inner margin is formed of peat. The northern part of this alluvium is continued in a narrow strip 2 or 3 miles in width into the Humber, which carries down part of the material by which it is here being continually extended. Another considerable portion of that material is the warp worn by the waves from the coast of Holderness.

The area referred to in the preceding paragraph forms so important and distinctive a feature of the geography of England, that it is necessary to devote to it a separate chapter (Chap. VI.), for the preparation of which I am indebted to my friend Mr. Bealby.

CHAPTER VI

THE FENS

1. Contrast between the Past and the Present

MACAULAY, writing of the year 1689, describes the country between Cambridge and the Wash as being "a vast and desolate fen, saturated with all the moisture of thirteen counties, and overhung during a greater part of the year with a low grey mist; high above which rose, visible many miles, the magnificent tower of Ely. In that dreary region, covered by vast flights of wild-fowl, a half-savage population, known by the name of the Breedlings, then led an amphibious life, sometimes wading and sometimes rowing from one islet of firm ground to another. The roads were among the worst of the world."¹ If dated sixty years earlier this description would have been singularly accurate. At the present day it would be, not singularly inaccurate, but in every particular diametrically opposed to the real facts. For ages the popular idea of the Fens was embodied in pictures of vast reed-grown morasses, swarming with reptilian life, a quaking water-logged soil, impassable roads or no roads at all, a dreary and monotonous flatness, evasive distances shrouded in mist, a damp chilly climate, and

¹ *History of England.*



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Frith, photo.

an amphibious and boorish population, racked by ague, rheumatism, and other diseases incidental to a "fenny" region. But of all this not a trace would be found at the present day. Flat the Fenland is, and low-lying, and probably it ever will be so; for what nature has modelled on the grand scale surpasses the cunning of man to reshape, though modify it superficially he may. Instead of being drowned and saturated with water, the Fens are now so dry, owing to the thoroughly effective drainage, that instances are known in which farmers have actually been obliged to convey water from the rivers for the use of their cattle in the yards, not in the height of a dry summer but in the depth of winter. Nor do wild-fowl any longer frequent the Fens in brooding myriads. The solitude and quietude which they love no longer exist there; every acre—indeed it were scarce an exaggeration to say every square yard—of the surface has been brought under cultivation. Nor can the inhabitants be any longer justly characterised by the uncomplimentary epithets of Henry VIII.; they are neither more ignorant nor more brutish than the population of England in general. And before the Fenland is stigmatised as dreary and uninteresting in point of natural beauty, it must not be forgotten that its glorious sunrises and sunsets, its "beauty as of a sea, of boundless expanse and freedom," have inspired some of the most eloquent passages which Charles Kingsley has written;¹ while to those who admire fine ecclesiastical buildings, there is probably no district in England which can offer such a cluster of noble churches, with finely proportioned towers, crowned

¹ See his *Prose Idylls* and *Hereward the Wake*. The influence which the scenery and associations of Lincolnshire had upon Tennyson's poetry is dwelt upon in the Rev. Canon H. D. Rawnsley's *Memories of the Tennysons* (Glasgow, 1900).

by graceful spires, as the fen parishes in the South Holland division of Lincolnshire. And is there not also a charm in fat pastures thickly dotted with red cattle and white sheep, and rolling crops of golden grain, and vast sky spaces ringing and ringing again with the bursting music of the meadow-lark?

2. Geography of the Fen District

Although distributed among six counties—to wit, Lincolnshire, Cambridgeshire, Huntingdonshire, Norfolk, Suffolk, and Northamptonshire—the Fens are a compact and homogeneous region, over 70 miles long by 20 to 35 wide, and stretch from Lincoln in the north very nearly as far as Cambridge in the south; the western boundary being approximately marked by a line drawn through Sleaford, Bourne, Stamford, Peterborough, and Ramsey. But, although the surface is in some cases 5 to 10 feet below the level of ordinary spring tides, the Fenland is not, as the Romans seem to have imagined by the name of *Metaris Æstuarium* which they gave to the Wash, a river estuary: it is a silted-up bay, or rather, geologically speaking, it is a shallow basin, over 1300 square miles in extent, excavated out of the Kimmeridge, Oxford, and Boulder Clays by the action of the sea, after it had burst through the Chalk barrier which connected Norfolk with the Lincolnshire Wolds; and the basin thus formed was subsequently filled in with deposits of silt and gravel, brought down by the rivers, and afterwards over large tracts covered with peat. The silt “occupies most of the seaward portions of the Fens, but runs into the peat in many places. As a rule the peat lies thickest on the west; the silt is in great force upon the east. There is indeed a more or less perfect dovetailing of beds of silt

and peat, showing that from the gravel upwards land, fresh-water, and marine conditions have alternated. When the country was flooded more or less completely with fresh-water, the peat grew. When the surface became dry, forests flourished. When the sea obtained the mastery, silt was deposited."¹ Previous to the deposition of the Boulder Clays, which of course took place during the Glacial Epoch, the entire region was covered with Cretaceous strata, which were gradually worn down and forced back towards the interior, exposing the Oolitic substrata which lay underneath. The gravels belong to the oldest deposits in the region. In addition to girdling the Fens in a narrow belt, they have built up several firm "islands" in the midst of the peat and silt; and on these islands (*e.g.* Ely, Thorney, Ramsey, Crowland, Manea, March, Chatteris, Spalding, etc.) the oldest towns and settlements were founded. Imbedded in the peat, which is black in colour and spread over an area of 600 square miles to a present thickness of 3 to 8 feet, remains of great forests have been found,² as well as bones of animals now extinct in England, such as the urus (wild ox), Irish elk, elephant, mammoth, wild horse, cave lion, woolly rhinoceros, and wild boar.³

The geography of the Fen region is determined in an intimate manner by the rivers, to which its formation is essentially due. These streams—the Witham, Welland, Nene, Great Ouse, and Little Ouse, with their affluents and feeders—are the trunk lines of a highly complex system of artificial drainage, which embraces the whole of the Fenland. As a rule, the lower course, and often

¹ Miller and Skertchly, *The Fenland, Past and Present* (Wisbech and London, 1878), p. 553.

² See Miller and Skertchly, pp. 566-572.

³ *Op. cit.* pp. 323-334.

the middle course too, of the Fen rivers are trained between high earthen banks (maximum vertical height, about 15 feet), much in the same way as the arms of the Rhine are trained in Holland and the Po in Italy. In some places the bed of the stream is almost on a level with the surface of the country through which the river flows. Into these numerous drainage-arteries the water is lifted by powerful steam-pumps. The sea also is kept out by embankments, or "sea-walls," built all round the Wash. The oldest of these, extending between Wainfleet, Spalding, and Lynn, is traditionally reputed to have been thrown up by the Romans, though some investigators attribute them to an even earlier period. The discipline of the rivers being dependent upon such frail curbs as these, it is not surprising to learn that their main channels have not always followed the same directions as they do now. For instance, whereas formerly the Witham entered the sea at Wainfleet,¹ now it pours into the Wash below Boston, some 20 miles farther to the south-west. In remote ages the Nene and the Great Ouse both made their way into the Wash past the town of Wisbech;² and the Little Ouse struck the sea below Lynn. Now, however, the Little Ouse is merely a tributary of the Great Ouse; the Great Ouse disembogues at Lynn; and the Nene alone finds the sea by way of Wisbech.

3. Early Attempts at Reclamation and Settlement

No systematic attempt has ever been made to drain the Fen region as a whole. The work of reclamation has been done piecemeal, river by river, and almost fen by

¹ So Stukeley, in his edition of Richard of Cirencester's *Chronicle*.

² This name, according to Dugdale in his *History of Imbanking and Draining* (London, 1772), p. 394, is derived from "Ouse" and "beach."

fen. The Romans, besides banking out the sea, dug the *Caer* or *Car Dyke* from Ramsey, or perhaps from Cambridge, to the Witham at Lincoln. Into this catchment drain they collected the rainfall of the higher lands which border the Fens on the west, and so prevented it from being poured over the banks of the swollen rivers upon the low-lying fenland. But after the Romans deserted Britain, their engineering works were neglected, and consequently fell into decay, and eventually the Fens relapsed to a great extent into the state of nature. In that condition they seem to have remained until the middle of the seventh century, when the monastic orders, keenly alive in England as elsewhere to the value of fertile soil, streams abounding in fish, and good water communication, founded monasteries, abbeys, churches, and even great cathedrals (*e.g.* Peterborough and Ely) on every "island" throughout the region, and strung the banks of the rivers, especially the Witham,¹ with the houses of their orders. But beyond the immediate vicinity of their settlements they do not seem to have done much, if anything at all, for the reclamation or preservation of the Fens. Then came the terror of the Northmen, whose raids were especially destructive in these quarters by reason of the easy accessibility which the waterways offered to their shallow narrow-nosed dragon-ships. Apart from these glimmering centres of mediæval civilisation, the Fens, notwithstanding an abortive attempt which William the Conqueror's chamberlain, Richard de Rulos, made to drain Deeping (Welland) Fen, and the partial afforestation of the

¹ On the Witham, within a distance of 20 miles south of Lincoln, there were no less than twelve religious houses, — Monk's House, Barlings, Bardney, Topholme, Stixwold, Kirkstead, Tattershall, Kyme, Catley, Mere, Nocton, and Haverholm. See Dr. G. Oliver, *An Account of the Religious Houses of the River Witham* (London, 1846), pp. 30, 31.

district by those lovers of the chase, the early Plantagenet kings, the Fens remained in great part as nature shaped them. And yet another blow was struck at them by the dissolution of the monasteries in the reign of Henry VIII.

4. Drainage Works of the Seventeenth and subsequent Centuries

In the Netherlands the seventeenth century was a period of more than ordinary activity in the long, long struggle which man has there waged against river and sea; and from the Netherlands the same spirit of re-enchanted activity was propagated across the North Sea to England, in the person of Cornelius Vermuyden and others of his countrymen. In Elizabeth's reign one Thomas Lovell had spent all his fortune in a disastrous attempt to drain Deeping Fen. The project was taken up with happier energy and greater success in the reign of Charles I., when (in 1638) the king empowered Sir Anthony Thomas, Sir William Ayloff, and others, to accomplish the work which Lovell had begun. But very shortly before this the drainage of the Witham fens, amounting to 216,000 acres in all, had been undertaken by the Earl of Lindsey, the same Sir Anthony Thomas, Sir William Killigrew, King Charles himself, and other "adventurers," as the drainers were generally styled. But an even greater undertaking contemporary with this last scheme was the drainage of the fens of the Nene and the Great Ouse, afterwards known collectively as the Great Bedford Level. The concession was given to Francis, Earl of Bedford, who called in to his aid the Dutchman, Vermuyden, who had already carried through similar engineering schemes in the Thames valley and in Hatfield Chase in Yorkshire, though he had just failed

to execute a scheme of his own for draining the same Great Level. Under his dogged persistency, backed by the authority and influence of the Earl, various works were carried out between 1630 and the end of the century, such as the embanking of the Welland, the digging of the Old and New Bedford rivers (whereby the course of the Great Ouse was shortened and straightened), of Peakirk Drain, Bevill's Leam, Twenty-Foot Drain, Vermuyden's Drain, the Sixteen-Foot River, and others in the interlacing network of channels which cover the Fens, and the construction of a great sluice at Denver, for the purpose of damming back the old circuitous course of the Great Ouse. To all these schemes a stubborn opposition was offered by the native population,¹ who in the inclosure and appropriation of the Fens discerned, and rightly enough, the threatened loss of their time-honoured rights of free fishing, fowling, grazing, turbary (cutting turf), etc. Seizing the opportunity of the outbreak of hostilities between the King and the Parliament, they hastened to destroy the works which the drainers had constructed, and in particular made havoc of the drains, inclosures, and farms in the fens of the Witham and Welland districts. Nor was it Macaulay's Breedlings alone who manifested their hostility to the drainage of the Fens. No less a person than Oliver Cromwell "so strenuously opposed the scheme of draining the Fens . . . that by his plausibility, activity, and interest . . . he obliged the projectors to drop their intention," and this policy "gained him a great accession

¹ For specimens of the ultra-conservative arguments advanced against draining generally, see witty Fuller's *History of the University of Cambridge* (1655). Consult also *Fenland Notes and Queries* (Peterborough), years 1894 and 1895, and Marratt, *History of Lincolnshire* (Boston, 1814-16), vol. i. pp. 138-146, and vol. ii. pp. 187-189.

of friends, and procured him the title of Lord of the Fens."¹

The work thus prejudicially interrupted was not resumed for more than a century, and in the case of certain of the fens for more than a century and a half. Meanwhile the state of the rivers grew from bad to worse. In 1735 and 1736 the Witham for several miles above Boston was not more than 20 feet wide and $4\frac{1}{2}$ feet deep,² and the banks were so gapped with breaches that the water ran in and out of the fens on both sides exactly as it pleased. And yet in the thirteenth and fourteenth centuries Boston and Lincoln had ranked amongst the very first seaports of the kingdom; and in ancient times, says Dugdale,³ "great vessels passed from Boston to Lincoln." The first beginning of the effectual reclamation of the Witham fens was carried through by the construction of the North Forty-Foot Drain by Earl Fitzwilliam, as a purely private undertaking, in 1720. Half a century later (that is, in 1767) Holland Fen was drained, and the drainage of the Black Sluice Fens first made really satisfactory; and in 1801-1807 the fens (East Fen, West Fen, and Wildmore Fen) on the east side of the Witham were recovered. The plans for the drainage of these last were devised by Sir John Rennie, who reverted to the system of the Romans, by digging a catch-water drain along the northern border of the fens to carry off separately the precipitation of the higher lands beyond. The Deeping and other Welland fens were drained under

¹ Mark Noble, *Memoirs of the Protectoral House of Cromwell* (1787), vol. i. pp. 107, 108.

² W. Chapman, *Facts and Remarks relative to the Witham and the Welland* (Boston, 1800), p. 27.

³ *History of Imbanking*, p. 168.

various Acts of Parliament obtained in 1794, 1801, 1824, and subsequent years.

Nevertheless, in spite of all these schemes of drainage, reclamation, and inclosure, nothing was done to assist the rivers to discharge their proper functions in a natural manner, rather the contrary, until after the beginning of the nineteenth century. It is an inevitable result of the uniform flatness of the region, and consequently of the comparative slight fall of the rivers, that every deterioration in their drainage efficiency is traceable to the accumulation of sedimentary matter in their lower courses, more especially in the last few miles before they plunge into deep water in the Wash. And yet, astonishing though it may seem, it is the fact that no serious or successful attempt was ever made to improve the outfalls before the year 1721, when the elder Kinderley proposed to regulate the outflow of the Nene at Wisbech; but even then it took more than half a century before his plans were carried into effect, and more than a century before the outfall was dealt with in a proper and satisfactory manner. The Witham outfall was not effectually dealt with until so late a period as 1880-1884, although there was more than one previous attempt to regulate the stream above the outfall. The Welland outfall was greatly improved, though not in a completely efficient manner, in 1794 and 1835; and the Great Ouse in 1821 and subsequent years.

During the fifteen hundred years which have elapsed since the departure of the Romans out of Britain, it is computed that between 60,000 and 70,000 acres of land have been won from the sea—that is to say, from the Wash, embanked, drained, and brought under cultivation. The accretion has been greatest at the head of the bay, between the mouth of the Great Ouse and the

mouth of the Welland, where the annual average gain is estimated at 10 to 11 lineal feet. In 1839 Rennie, improving upon a scheme which was made public by Nathaniel Kinderley (the younger) in 1751, recommended that the outfalls of the four Fen rivers should be guided by means of fascined channels into one common outfall, and that the land between them should be inclosed as fast as it consolidated. By this means he estimated that an area of 150,000 acres would be won to cultivation. But beyond one or two still-born or abortive projects about the middle of the nineteenth century, nothing has come of this suggestion.

5. Fauna and Agriculture of the Fens

In the days when the Fens were uninclosed, their streams and meres were famous for their wealth of fresh-water fish—pike, eels, perch, bream, tench, rudd, dace, roach, stickleback, lamprey, and eel-pout. "Witham pike, none like," saith an old rhyming saw; and the quaint Fuller called the same voracious fish "the fresh-water wolf." Eels were present in enormous quantities, as the monks of Ramsey must have experienced when they were able to make a yearly present of 4000 of these fish to their brethren of Peterborough; and it was no uncommon thing for rents to be assessed at so many thousands of eels. And the multitude of fish was fully equalled by the multitude of wild-fowl, which embraced such species as the wild duck, wild goose, gargany, widgeon or pochard, shoveler, knot, teal, peewit, black and great tern, great and lesser-crested grebe, black and little grebe, coot, water-hen, water-rail, redshank, godwit, whimbrel, ruff and reeve, buzzard, heron, bittern, wild swan, and others. Of these the wild duck, widgeon, teal,

and similar birds used to be taken in vast quantities in decoys; in one season, a few years previous to the inclosure of the East Fen, ten decoys furnished 31,200 ducks, widgeon, and teal for the London market.¹ But the effective draining of the Fens has banished almost the whole of these creatures, finned as well as winged. Nor are tame geese now reared in anything like the numbers they were, whilst the Fens were still in the condition of open commons. It was no unusual thing for a simple cottager to own over 1000 brood geese, and De Foe, in his *Tour through the Eastern Counties*, 1722, speaks of meeting "droves with a thousand, sometimes two thousand in a drove," on their way to the London markets between August and the end of October.

Notwithstanding a shrinkage of one to two feet in the depth of the peat, a consequence of the extraction of the water by drainage, the soil of the recovered Fens is amongst the most fertile in England. Wheat and roots grow in great quantity and of fine quality; and the grazing lands (though these are generally the older inclosed parts) will, unaided by artificial foods, fatten cattle during the course of the summer months. Excellent testimony to the value of draining and inclosing the Fens is borne by Arthur Young,² than whom no more competent authority could be quoted. "There are few instances of the benefit of inclosing commons greater than that of Long Sutton; the Act passed in 1788, by which near 4000 acres of common became several property,—the rent of it before inclosing was £1000 a year; the whole now lets from 30s. to 50s. an acre,

¹ C. Oldfield, *A Topographical and Historical Account of Wainfleet* (London, 1829), Appendix.

² *General View of the Agriculture of the County of Lincoln* (London, 1799), p. 77.

and about half of it is ploughed." "Deeping Fen, which extends most of the 11 miles from that town to Spalding, is a very capital improvement by draining. Twenty years ago the lands sold for about £3 an acre; some was then let at 7s. or 8s. an acre, and a great deal was in such a state that nobody would rent it. Now it is in general worth 20s. an acre, and sells at £20 an acre" (p. 235). Before the drainage (1767) the 22,000 acres of Holland Fen let for a gross rental of £3600; at the end of the century (*i.e.* in 1799) they were let for nearly £30,000, tithe free. "Seventeen acres in Wyberton, inclosed under the Holland Fen Act, that had never been either ploughed or pared, sold lately for 1200 guineas, more than 70 guineas an acre" (p. 41).

6. Inhabitants of the Fens

The earliest inhabitants of this region of whom there exist records were the British tribes of the Iceni confederation, who fought the Romans so stoutly under Boadicea. In Saxon times the Fen-dwellers are called Gyrvi, and are described as using stilts for the purpose of traversing the country; just as at a later date their descendants used jumping-poles for the same purpose. The famous Camp of Refuge, from which Hereward the Wake so long set at defiance the conquering might of William the Norman, is sufficiently well known, or may be read of in a pleasant form in Charles Kingsley's novel. Cromwell's invincible Ironsides were in great part natives of the Fen country. The dialect, which the people preserved in daily use down to almost the end of the nineteenth century, was rich in idioms and vocabulary, strong and nervous as any dialect of English speech; and at the same time, as the late Professor Freeman

pointed out a quarter of a century ago, modern classical English traces its origin back to the same locality, *e.g.* *The Handlyng Synne* of Robert Manning, a native of Bourne, written about the year 1300. Tennyson's dialect poems, *The Northern Farmer* and others, are written in the dialect of Mid Lincolnshire, which shows some divergence from the native speech of the Fen-folk.

CHAPTER VII

WALES AND THE SOUTH-WEST OF ENGLAND

1. **Geology and superficial Configuration of Wales**

THESE two areas belong mainly to the oldest geological era, the Palæozoic. In Wales the Coal-Measures, the uppermost deposits assigned to this era, are present both in the north and south. In the north they form the whole of the left bank of the estuary of the Dee, facing the Triassic rocks of the peninsula of Wirral, and extend thence southwards, with one slight break, by Wrexham to beyond Oswestry in Shropshire. In the south they extend from St. Brides Bay in Pembrokeshire eastwards into Monmouthshire. Outliers of more recent, Mesozoic, age are found only in two places, one in the north, the other on the Bristol Channel. The first forms the fertile Vale of Clwyd in Denbighshire, where Triassic rocks, mostly overlaid, however, by recent drift deposits, form the bottom of the vale which has been thrown down by a fault against the Silurian rocks on its eastern side. In the south outliers both of the upper division of the Trias and of Lias occur in the south-eastern somewhat peninsular part of Glamorganshire, between Swansea Bay and Cardiff.

The greater part of Wales is made up of the older

members of the Palæozoic group, the Archæan, Cambrian and Silurian, or Ordovician and Silurian, the term Ordovician being now frequently applied to the Lower Silurian of Murchison or the upper members of the Lower Silurian of the geological survey, while the term Cambrian has been extended so as to embrace all the rocks from the Harlech series to the Tremadoc slates—that is, to the Cambrian and lower members of the Lower Silurian of the survey. For our purposes, however, it is unnecessary to dwell on any such distinctions, as all these ancient deposits have now been worked out into very similar physical features. It is enough, therefore, to say that these rocks occupy almost the whole of Wales except the south and south-east. The southern boundary runs from the north side of St. Brides Bay, first eastwards to the neighbourhood of Carmarthen Bay, then north-eastwards to Much Wenlock in Shropshire. To the north of this line all the strata have been much folded and contorted. They have accordingly been subjected to that strong lateral pressure which converts certain rocks into slate, which is met with here and there over the entire region, and is quarried in North Wales, especially Carnarvonshire, more abundantly than anywhere else in the world. The whole area, moreover, has been from a very remote period above the surface of the ocean, and hence has been subject to a prolonged erosion, in consequence of which the rocks, whether limestone, sandstone, or whatever their lithological character, have been worn away into ridges or small plateaux with steep sides, and having only narrow intervening valleys. In these valleys lie nearly all the inland villages and towns—the towns and more important villages lying at the intersection of two or more valleys.

On the south-east the Silurian rocks are bordered for

the most part by those of the Old Red Sandstone period, these rocks forming an extensive wedge, beginning in the north of Carmarthen Bay, and spreading out eastwards over the southern half of Brecknockshire into the west of England, where its eastern margin runs from about Much Wenlock to the mouth of the Severn, and the alluvium bordering the Bristol Channel above Cardiff. The boundary between the two is peculiarly well marked in the east of Carmarthenshire and the west of Brecknockshire, where, along a well-defined line curving slightly to the south-east, Old Red Sandstone plateaux slope down to the Ludlow series of the Upper Silurian. In the Old Red Sandstone area the physical features are similar to those of the older area to the north-west, but the characteristic valleys are somewhat broader, their sides less steep, at least in the lower slopes, and the ridges to which they rise narrower and sharper.

South of the Old Red Sandstone, and west of Carmarthen Bay, immediately south of the Silurian rocks, lie the members of the Carboniferous system, mainly those of the Coal-Measures, but there are also outliers of Old Red Sandstone on both sides of Carmarthen Bay.

2. Outline of Wales

The outline of Wales seems to have been determined in a notable manner by the physical characteristics of rocks belonging to different geological formations. The island of Anglesey is mainly composed of hard crystalline rocks now generally regarded as Archæan—that is, as belonging to the oldest of all stratified rocks. The break between it and the mainland, the Menai Strait, runs chiefly through a narrow strip of Carboniferous

deposits. The eastern peninsula of Anglesey at the mouth of Beaumaris Bay is composed of hard Carboniferous Limestone. The same formation constitutes the lofty promontory of Great Orme's Head on the opposite side of the bay, while Llandudno Bay is hollowed out of a low isthmus of Silurian rock stretching eastwards to Little Orme's Head, which is the north end of another small patch of Carboniferous Limestone. Ancient cry-



GREAT ORME'S HEAD.

Poulton, photo.

stalline rocks similar to those of Anglesey form the buttress in the south-west of the peninsula of Carnarvon, which seems to a large extent to have been protected against marine erosion by these rocks. In the south-west of Cardigan Bay, the promontory terminating in St. David's Head and Ramsey Island is largely composed of similar ancient rocks, and between these two sets of ancient hard crystalline rocks the wide expanse of *Cardigan Bay* has been hollowed out. Skomer

Island, to the south of St. Brides Bay, is of a similar structure, and has served as a bulwark for the peninsula immediately behind forming the south side of that bay. The peninsular portion of Pembrokeshire known as *Rhos*, to the south of Milford Haven, is defended on the south by a rectangular boss of Carboniferous Limestone, while the arms of *Milford Haven* itself are mainly worn out of an outlier of Old Red Sandstone, the northern arm, however, advancing into the Coal-Measures. *Gower Peninsula* in the south-west of Glamorganshire is defended against the sea in the same way as *Rhos Peninsula* on the opposite side of Carmarthen Bay, and on the east side of Swansea Bay, opposite Gower Peninsula, Carboniferous Limestones reappear in front of the Coal-Measures of Glamorganshire. The Coal-Measures of South Wales generally, on the other hand, have been largely worn away by marine erosion. They have thus been partly removed at the head of St. Brides Bay. *Carmarthen Bay* has completely divided them into two sections, and on the east side of that bay Burry Inlet runs up eastwards into that formation, while Swansea Bay forms a large and wide indentation in the same deposits in the south.

3. The South Wales Coal-field

Notwithstanding the existence of the breach just referred to, the Coal-Measures extending from St. Brides Bay into Monmouthshire are to be regarded as forming a single coal-field. But the characteristics of that coal-field differ in different parts. It has been subjected to greater folding and more severe pressure in the west than in the east, and the western portion has hence been converted into the harder and more highly carbonaceous form of

coal known as anthracite. Such is the general character of all the coals west of Carmarthen Bay. To the east of that bay the coals of the Gower Peninsula, the upper seams of the Llanelly district, and approximately the coals of what is called the white ash series, south and east of a line drawn from Gower Road near the head of Burry Inlet eastward to Neath, Ystradyfodwg, and Navigation, and thence north to Merthyr Tydfil, are more or less bituminous, while north and west of that line the coals are less bituminous and change gradually to anthracite west of the vale of Neath. About two-thirds of all the coal raised in the field is estimated to be mined east of Maesteg (about the middle of the county of Glamorgan). The great bulk of the steam coal is obtained in the *Merthyr*, *Taff*, *Aberdare*, and *Rhondda* valleys from the white ash series, which is the lowest and by far the most valuable of the series for its coal, and which in addition contains the great argillaceous ironstone deposits which gave rise to the iron industry of the district, although, on account of the refractory character of the ore, now worked only to a limited extent. Most of the coal required for iron-making is raised on the northern outcrop of this series from Hirwain (north-west border of Aberdare) on the east to Blaenavon on the west.¹

The oval basin of the Forest of Dean, with its coal and iron ores, is an eastern outlier of this field, and so also is the Bristol coal-field.

¹ See paper by T. Forster Brown in *Trans. S. Wales Inst. of Engineers*, vol. ix. (1874), pp. 72, 73, 100.

4. Geology and superficial Configuration of the South-west of England

The description above given (pp. 94-120) of the south-east of England begins with the band of Lias that stretches continuously from the head of the estuary of the Severn to the mouth of the Tees. The region immediately to the south of that between the Severn and the Oolites (Cotswold Hills, etc.) is extremely complicated in its surface features. Lias Clays and Marlstone, Silurian rocks, deposits of Triassic age, Carboniferous Limestones, the Coal-Measures, and on the borders of the Severn recent alluvium, all appear in small patches as far as the *Mendip Hills*, which are composed of a band of Carboniferous Limestone stretching east and west. Probably this variety of geological structure, with the variety of soil to which it has given rise, contributes greatly to the fertility for which this district has always been famous. Some of the most fertile of these soils belong to the Middle and Upper Lias Clays, and south of the Mendip Hills these spread out over a considerable area of the south-east of Somerset, which is now, and no doubt has long been, one of the most populous agricultural districts of England. In the area between Ilminster and Chard on the west and Ilchester and Yeovil on the east agricultural villages are as thickly clustered together as anywhere else in the country. The area in question forms the bulk of the so-called Southern (parliamentary) Division of Somerset, which has a denser population than any other purely agricultural division in England—that is, any other division in which the population is not affected by mining or manufacturing industries, the existence of coast towns, or the presence of a residential population due to the vicinity of a large city. A tongue of Lower

Lias limestones and clays jutting out to the west forms the *Polden Hills*, which rise slightly above the marshy flats of Western Somerset traversed by the Axe, Brue, and Parret. The outline of these low hills is well marked by a circuit of villages.

Immediately to the west of the populous agricultural area just referred to is an almost equally populous area, of which Taunton is the centre, belonging to the Triassic system. Rocks of this age extend thence southwards to the coast of Devon, sending out tongues westwards and eastwards. West and south-west of this area the stratified rocks belong mainly to the Devonian and Upper Carboniferous series, but in addition to these there are large patches of igneous rock, chiefly granite or greenstone. In the north there is a large Devonian tract extending along the Bristol Channel north of Barnstaple Bay in Devon and Somerset. The area is on the whole elevated and includes *Exmoor Forest*,¹ whose broad, rounded, heath-clad heights slope gently down to broad fertile vales rendered beautiful by the richness of their cultivation. To the east are the *Brendon Hills*, and still farther east is a separate patch, the *Quantock Hills*, surrounded by Triassic rocks. To the south the whole extent of Mid and West Devon is occupied by Upper Carboniferous rocks forming a tableland of moderate fertility terminating on the sea-shore in upright, black cliffs. Still farther south, occupying South Devon and nearly the whole of Cornwall, Devonian rocks reappear along with the igneous patches already referred to. The largest of these is the deeply eroded granite tableland of *Dartmoor*, which is surrounded except on the south by Carboniferous rocks altered by heat. It has numerous summits, locally known as Tors, the highest of which,

¹ Dunkerry Beacon, 1690 feet.

Yes Tor (2077 feet), is the highest peak in the south-west of England. To the west lies *Bodmin Moor*, a similar granitic area ;¹ farther south-west behind Fowey harbour another of the same kind, from the weathering of the felspar in which is derived most of the China clay Cornwall. Another of these patches lies to the west of Falmouth harbour, and a fifth forms the peninsula



DARTMOOR AND THE TORS FROM OKEHAMPTON.

Frith, photo.

containing Land's End. Of the same structure are the *Scilly Isles*, lying some 20 to 30 miles west by south of this promontory.

The Devonian rocks, in the midst of which all these patches of granite lie with the exception of Dartmoor, are of different character from those on the Bristol Channel. In the immediate vicinity of the granite they have been hardened and crystallised by heat. Elsewhere the rocks have been converted into clay-slates.

¹ With Brown Willy, 1368 feet.



Frith, photo.

LAND'S END.

VOL. II

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In these slates occur the mineral veins, principally of tin and copper, for which Cornwall and South Devon are noted. To miners the adjacent rock, whatever variety of texture it may exhibit, is known as killas. The *minerals* have long constituted the principal wealth of this whole clay-slate region. The surface is mostly covered only with a thin soil, and is not very productive. A large part of it is moorland, while the granite bosses are to a large extent craggy. As late as 1794 a Mr. Frazer, employed by the Board of Agriculture to survey the county of Cornwall, described the internal parts as hitherto uncultivated, and, excepting the mining districts, almost without inhabitants; but the parts near the sea, where from a very early date sea-sand was used as the principal manure, and the lowlands in the valleys of the Tamar and Alan, are much more fertile.

5. Outline of the South-west of England

Like Wales, the south-western peninsula of England between the Bristol and the English Channel is characterised by numerous bold headlands, and here also these are in many cases due to the special hardness of rocks of a different kind from those adjacent. *Tintagel* in North Cornwall is a hard slate; *Trevoze Head*, farther south, is of greenstone, behind which Devonian slates complete the small peninsula to which it belongs, but which is joined to the mainland only by an isthmus of blown sand. *Pentire Point* and *Park Head*, farther south, are also wholly, and *Towan Head* partly, of greenstone. *St. Agnes Head* is of altered Devonian. The town of St. Ives is on a narrow strip of Devonian rock between masses of greenstone. The *Land's End* peninsula, as already mentioned, is of granite, and the

opposite peninsula to the east is composed of hornblende slate, serpentine, diallage, and other crystalline or altered rocks, *Lizard Head* itself being composed of metamorphic Devonian. On the east side of Cornwall, *Nare Head* is



TINTAGEL.

Frith, photo.

of greenstone; *Dodman Point* is a detached piece of Silurian; *Black Head* is of greenstone; and the promontories on both sides of Kingsbridge Inlet, running out seawards in *Bolt Head* and *Bolt Tail*, *Prawle Point* and *Start Point*, in the extreme south of Devon, are composed of a much altered and hardened Devonian rock.

CHAPTER VIII

THE VOLCANIC PHENOMENA OF THE BRITISH ISLES ¹

1. General Observations

THE "ring of fire" round the Pacific is one of the commonplaces of geography and geology. It was long ago brought forward as a confirmation of the theory bringing volcanic eruptions into casual connection with the infiltrations of water from the ocean. That there is such a connection there is good reason to believe, but the absence of volcanoes on many a sea margin, and particularly on the shores of the Atlantic, clearly shows that something further is required to explain the phenomena. Another important condition has been pointed out by Suess in his proof of the association of volcanic disturbances with the great dislocations of the earth's crust. Hence the Pacific is girt with volcanoes because it is in great part bordered by lines of recent folding and upheaval, while the Atlantic has no volcanoes, chiefly because of the absence of such lines. But it has not always been so. In former geological ages the shores of Western Europe have been subject to the same unrest, the same process of folding giving rise

¹ Based on Sir Arch. Geikie's *Ancient Volcanoes of Great Britain* (Macmillan, 1897).

to mountain chains, and this stage of the history of the earth's crust has been accompanied in that part of the world also by volcanic phenomena. From their position the British Isles have again and again been embraced in these movements, and among the rocks of these islands there are numerous remains of all the types of volcanic activity, whether in the form of regular cones, like that of Vesuvius, of small scattered "puys," or extensive plateaux, due to fissure eruptions, such as are still taking place in Iceland, from pre-Cambrian down to Tertiary times. These outbreaks have not been incessant, and they have varied in intensity and extent. They have, however, at different times embraced simultaneously different parts of the British Isles, and it is hence convenient to review the whole series of movements in one chapter.

Not only have the British Isles been again and again included in the marginal area of disturbance and volcanism on the Atlantic shores of Europe, but the outbursts in these islands have taken place repeatedly within certain limited areas, while others have entirely escaped or have been free from volcanoes since the beginnings of geological time. Thus the Central Highlands of Scotland (between Strathmore and Glenmore) show no signs of volcanic activity except in the metamorphism of their schists, and the Southern Uplands of the same country are unpierced by volcanoes, although both regions have more than once looked down on volcanic eruptions in the regions immediately adjacent, and in some places have their flanks covered by outpourings of lava or showers of ash. So also the Carboniferous Limestone of England and Ireland are almost without volcanic remains or traces of volcanic influence, and all the contemporaneous volcanic rocks of the islands lie west of a line drawn

from Berwick southwards to Leicester, and then south-west to Exeter and south to Tor Bay.

Two other facts of a general nature are worthy of notice. The first is that the place of occurrence of the vents or centres of eruption has not unusually been determined "by any obvious structure in the rocks now visible." The vents but rarely lie on any ascertainable lines of fault. Moreover, they have no well-marked relation to the present topographical features apart from those of which they are themselves in part the cause, but, on the other hand, it is noteworthy that they have generally been opened out not on ridges and hills, but in districts that formed low grounds and valleys at the time of eruption. The other fact is that, with the exception of the Tertiary volcanoes, all those of the British Isles have at some period of their history sunk down below the surface of the sea, and been buried under aqueous deposits. The probability is that the volcanic eruptions are the direct cause of the subsidence, the crust being left unsupported by the ejection of matter from beneath, and thus tending to sink. Even since Tertiary times there are evidences of a subsidence having taken place in the affected area of the British Isles, the most remarkable example of this kind being in the area round Lough Neagh. This lake is nearly surrounded by Tertiary volcanic deposits, nearly the whole area covered by which slopes gently towards the lake, which occupies about one-eighth of the whole area of subsidence,¹ and, though the largest, is one of the shallowest of British lakes, its average depth being under 40 feet.

¹ *Op. cit.* vol. ii. p. 448.

2. Pre-Cambrian Eruptions

The most extensive tracts, representing what were probably pre-Cambrian volcanic eruptions, consist of the Lewisian gneiss, which makes up almost the whole of the Outer Hebrides, and extends over considerable areas of the mainland of Scotland from Loch Eriboll to the head of Loch Alsh, and also forms the islands of Coll, Tiree, and Iona, and reappears in the south-west of Mull, as well as in the north of Sutherland, in patches east of Loch Eriboll, as far as the banks of the Borgie ($4^{\circ} 15' W.$). This gneiss, in the opinion of Sir Archibald Geikie, "affords us glimpses of probable volcanic activity at the very beginning of geological history." It "may have been originally a mass of various eruptive rocks," but "it has subsequently undergone a succession of deformations from enormous stresses within the terrestrial crust."¹

Among the greatly altered sedimentary rocks of uncertain age forming the highlands of Scotland to the east of Glenmore, the series to which Sir A. Geikie has given the name of Dalradian,² there occur, in addition to numerous "obviously eruptive masses," a great variety of "green schists," the colouring matter in which is believed by the same geologist, and now also by many others, to represent a "fine basic volcanic dust."³

In England the volcanic rocks that have been recognised as forming the core of an ancient ridge, extending from near Wellington in Shropshire, through the Wrekin and Caer Caradoc between Wenlock Edge and the Long-

¹ *Op. cit.* vol. i. pp. 115, 121.

² "From Dalriada, the name of the old Celtic kingdom of the north of Ireland and south-west of Scotland" (*Ibid.* p. 124).

³ *Ibid.* p. 125.



THIS MALVERN HILLS FROM CAMP HILL.

Kitch, photo.

mynd to beyond Church Stretton, must, it is thought, be referred to pre-Cambrian times;¹ and there is reason for believing that there is a relic of an equally ancient volcanic district in the heart of the Malvern Hills,² and possibly in the heights of Charnwood³ Forest. A pre-Cambrian age is also conjectured for the gneisses and schists of Anglesey and Carnarvon, amidst which signs of contemporaneous volcanic activity have been discovered.⁴

3. Eruptions from the beginning of the Cambrian to the end of the Silurian Period

It is in Wales that Cambrian volcanoes have been chiefly recognised, partly in South Wales on the north side of St. Brides Bay, all round St. David's; partly in North Wales, in Carnarvonshire between Carnarvon and Bangor; and another patch to the east between Penygroes and Bethesda, and in Merionethshire near Dolgelly, where a volcano that continued in activity into Silurian times began while the Cambrian strata were still being deposited. But these are not the sole evidences of volcanic activity belonging to that time. A volcano was again in eruption in the Malvern Hills, and also among the small detached patch of Cambrian rocks in North-eastern Warwickshire, between Nuneaton and Atherstone.

In the following periods, volcanic activity was very extensively developed, but it was confined or almost confined in Great Britain to the epoch of the Lower Silurian formations, and chiefly to those upper members of the Lower Silurian to which Prof. Lapworth has applied the name of Ordovician. Only a small volcanic outburst near Wotton-under-Edge in Gloucestershire is

¹ *Op. cit.* vol. i. p. 133.

² *Ibid.* p. 134.

³ *Ibid.* p. 135.

⁴ *Ibid.* pp. 127-129.

doubtfully referred to the Upper Silurian epoch. Wales and the Lake District show by far the most abundant remains of the Silurian volcanoes. In the principality an extensive tract in the centre of Carnarvon and Merioneth, stretching from the mouth of the Conway southwards to Cader Idris and the Dysynni, and from Snowdon south-east to Aran Mawddwy, is largely over-spread with lavas and tuffs of this period, besides containing large bosses, sills, and dykes of "greenstone." Other Welsh areas of eruption are one in Radnorshire to the north of the Wye, between Builth and Llandrindod Wells; an area in North Pembrokeshire, where there are several volcanic patches; one on the borders of the counties of Denbigh, Montgomery, and Merioneth, on the banks of the Rhaiadr, embracing the southern portion of Mount Berwyn; and others on the borders of Shropshire and Montgomeryshire, near the towns of Welshpool and Montgomery.

In the Lake District the volcanic remains of this period are spread over the area from Shap Fell and Ullswater to the coast of Cumberland, from the west side of the estuary of the Duddon to the neighbourhood of St. Bee's Head. In Scotland they cover a considerable tract on both sides of the Stinchar in South Ayrshire, and reappear in many places to the north-east, as far as the Eddleston Water in Peebleshire. In Ireland traces of volcanic activity have been discerned at various places in the northern half of the island. In County Tyrone there is an area measuring 24 miles in length by about 9 miles at its widest part, composed of crushed cherts, igneous rocks, and sandstones, believed by Sir A. Geikie to be of Lower Silurian age, similar to and representing an area of like constituents in Scotland, wedged in between the schists and the Old Red Sand-

stone along the southern margin of the Highlands.¹ There are isolated patches of volcanic rock in counties Louth and Galway. But the chief region of volcanic activity in this island is in the partly mountainous, partly lowland district, between the coast of County Wicklow and that of County Waterford, among Lower Silurian formations. Generally the activity has been feebler here than in Wales and the English Lake districts, but at the southern or rather south-western end of the belt, where the vents have been most numerous and most active, the volcanic remains are of the most remarkable character.

"The coast-line of County Waterford, from Tramore westward to Ballyvoyle Head—a distance of nearly 15 miles—presents, perhaps, the most wonderful series of sections of volcanic vents within the British Islands. No one coming from the island is prepared for either the striking character of the cliff scenery or the extraordinary geological structure there presented, for the country is, on the whole, rather featureless, and much of it is smoothed over and obscured by a covering of drift, through which occasional knobs of the harder felsites protrude. The cliffs for mile after mile range from 100 to 150, or 200 feet in height, and present naked vertical walls of rocks, trenched by colossal gullies, through which a descent may be made to the beach. Throughout the whole distance agglomerates and felsites succeed each other in bewildering confusion, varied here and there by the intercalation of Lower Silurian shales and limestones, involved and pierced by the igneous rocks. Hardly any bedded volcanic material is to be recognised from one end to the other. The sea has laid bare a succession of volcanic vents placed so close to each

Op. cit. vol. i. pp. 239, 240.

other that it will be difficult or impossible to separate them out.”¹

In the west of County Kerry, in the tract known as the Dingle promontory, to the north of the Dingle River, traces of volcanic rocks of Upper Silurian times are to be seen at various localities.

4. Eruptions of the Devonian Period

As is now well known, the physical conditions under which the rocks represented in Great Britain, next in succession to the Silurian, were laid down, differed greatly in different parts of the island. In the south-west of England south of the Bristol Channel, in the counties of Devon and Cornwall, these rocks were originally sediments in an open sea, as most of the corresponding rocks on the mainland of Europe also were; but in the rest of Great Britain they were formed on the bed of large inland lakes. The former rocks are known as Devonian, and the others are classed under the general name of the Old Red Sandstone, from the lithological character of one of the prevailing members of the system. Volcanic remains have been found in both. The chief display of volcanic activity in the Devonian area and period is represented by the remains known as the Ashprington volcanic series near Totnes.

The formation of the lakes whose beds were the recipients of the deposits of the Old Red Sandstone period seems to have been due to processes of folding and elevation, accompanied by local subsidences, and these disturbances were accompanied by considerable manifestations of volcanic activity. Four great lakes in Scotland and the north of England have been recognised

¹ *Op. cit.* vol. i. p. 247.

as separate areas of aqueous deposit, with volcanic remains of more or less considerable extent. In the Old Red Sandstone of South Wales no such remains have been found, but in Ireland they have been met with among rocks of similar lithological character, and corresponding in geological position among the heights lying immediately to the east of the Lakes of Killarney. But the areas referred to in North Britain are those which chiefly concern us here. The northernmost of these areas, which is now in a great measure submerged beneath the North Sea and the Atlantic, lay between the North and Central Highlands of Scotland, and extended north-east from the head of the Moray Firth and Caithness, so as to include the Orkney part of the Shetland Islands. From the fact that the Orkney Islands lie about the middle of this ancient lake, it has been named by Sir A. Geikie, *Lake Orcadie*. A second, still larger lake, stretching between the Highlands and Southern Uplands of Scotland south-westwards across Arran and the peninsula of Kintyre, to the eastern shore of Lough Larne in Ireland, has been named by the same authority *Lake Caledonia*. A third, embracing the Cheviot Hills and Berwickshire, he has called *Lake Cheviot*, which seems to have had some smaller lakes of the same period in adjacent areas. The fourth lake, called *Lake Lorne*, lay in the west of what is now the mainland of Argyllshire and extended from Loch Creran to Loch Melfort and the hills on the west side of Loch Awe.¹ Though these lakes ultimately sank to such a depth as to receive deposits many thousands of feet in thickness, they subsided slowly and apparently at about the same rate as sedimentation proceeded, for the deposits are all of a shallow water character; and as

¹ *Op. cit.* vol. i. pp. 271, 272.

they sank and the deposits accumulated groups of volcanoes rose in long lines from the water, and threw out enormous quantities of lava and ashes, in some cases covering hundreds of square miles in extent.¹ Of the four lakes named, Lake Orcadie is that which has the scantiest volcanic remains still visible—chiefly round St. Magnus Bay and Ronas Voe on the Mainland of Shetland, and at sundry points on Hoy in Orkney. In Lake Caledonia, on the other hand, such remains are very extensive, principally in Scotland, though also met with in County Tyrone in Ireland. In Scotland, the principal area extends from Bridge of Allan through the Ochil Hills, and from their eastern end in one branch eastwards along the south side of the Firth of Tay to Tayport, and in another branch less continuously north-eastwards over the *Sidlaw Hills* to the coast south of Montrose, and then parallel to the coast north of Montrose harbour to the neighbourhood of Stonehaven. The remains here are chiefly in the form of lavas with intercalated thin tuffs and breccias, but also include in the *Ochil Hills* and the districts to the east considerable tracts of breccias, tuffs, and conglomerates exposed superficially. The remains of other lines of volcanoes are found on or near the margins of the lake, those on the north in a comparatively narrow strip from Glen Artney in Perthshire to Glen Prossin in Forfarshire, those on the south much more extensively developed from Carrick in South Ayrshire (including an isolated patch on the coast to the north-west of Maybole) to the immediate neighbourhood of Edinburgh (the *Blackford Hills*). In both series lavas again predominate, but volcanic breccias and tuffs (chiefly felsitic) abound to the south and east of the Pentland Hills.

¹ *Op. cit.* vol. i. p. 268.

The volcanic remains of Lake Cheviot are imposing in respect of their mass of thick bedded lavas, separated by only comparatively thin layers of tuff. They surround the granitic boss containing the highest peak of the Cheviot Hills in a continuous circle, with a prolongation northwards towards Greenlaw, and themselves reach an elevation of 2676 feet above sea-level. The total area over which they are still uncovered is about 230 square miles, and their thickness "probably amounts to several thousand feet."¹

In the Lake of Lorne the volcanic remains are of considerable extent and great topographic importance, having given rise, by their resistance to the agents of denudation, to the hills extending from Loch Melfort to Loch Creran, as well as some of those on the sides of Glen Coe. They consist partly of sheets of bedded lava, but to a large extent of thick conglomerates formed by the exposure of masses of lava and other rocks to the action of breakers on the sea shore.

5. Volcanoes of the Carboniferous Period

The Devonian period was put an end to by the slow submergence of the greater part of the British Isles beneath the sea. The submergence seems to have been everywhere gentle and gradual, but was greater towards the south than towards the north, so that while the deposits of South and Central England during this period represent those of a deep clear sea, those of the north (including the south of Scotland) indicate a shallower sea. At its greatest extent this sea stretched east and west for a length of 700 miles, from the west of Ireland into Westphalia. This was followed by a

¹ *Op. cit.* vol. i. pp. 336, 337.

period of gentle elevation, now characterised by sandstones, shales, and other remains of shallow water deposits, and this elevation continued until extensive terrestrial remains came to be associated in close alternation with those of marine origin. Such is the series of changes that characterised the Carboniferous period, during the earlier half of which there was a considerable renewal of volcanic activity. The remains of these disturbances are found in two forms: first, that of plateaux, which are confined to Scotland; and, second, that of puys or vents, which, whether standing singly or in groups, generally discharged only small quantities of fragmentary material. The plateaux are generally still represented by remains in the form of broad elevated tracts of country, though their extent has been greatly reduced since Carboniferous times by denudation. The most extensive, and that of which the most widespread remains still survive, is named by Sir A. Geikie the Clyde Plateau, from the fact that it still occupies large areas on both sides of the Clyde from Stirling to Arran and the south end of Kintyre. The hills of Renfrewshire, and the Kilpatrick Hills and Campsie Fells in the counties of Dumbarton and Stirling, as well as the area on the borders of Lanarkshire and Ayrshire (all largely covered with lavas of this period), once formed portions of this continuous plateau, the whole area of which is estimated by Geikie to have been between 2000 and 3000 square miles.¹ Of the plateau known as the Midlothian Plateau the remains are much scantier. They lie along the north-west face of the Pentland Hills, reappearing in the *Castle Rock*, the *Calton Hill*, and *Arthur's Seat*, in and near Edinburgh. More extensive are those of the Garleton or East Lothian Plateau, necks of which survive

¹ *Op. cit.* vol. i. pp. 368, 369.

in *North Berwick Law*, *Traprain Law*, and the *Bass Rock*. A fourth plateau, which has been called the Berwickshire Plateau, extended from the north flanks of the Cheviot Hills through the Merse of Berwickshire, and a fifth of more considerable extent is now represented by only comparatively scanty remains in Liddisdale, and among the hills and lowlands to north of that valley and the Solway Firth. To this has been given the name of the Solway Plateau.

The plateau type of volcanic eruption belonged to the earlier portion of the Carboniferous Limestone epoch, while the puys belong to a later date.² These are most abundant in the region of the upper part of the Firth of Forth and the mouth of the river Forth, but they are also found on the margin of the Clyde Plateau (North Ayrshire) and amongst the remains of the Solway Plateau (in Liddisdale, etc.).

Among the Carboniferous rocks of the north of England there are no remains of volcanic activity in the strict sense of the term, but Sir A. Geikie regards the *Great Whin Sill* as an intrusive sheet, with a width varying from 20 to 150 feet and an average width of 80 to 100 feet, stretching for a distance of 80 miles, from the Farne Islands off the coast of Northumberland to Burton Fell (in Westmorland, east of Appleby) on the eastern face of the Pennine Chain, and well-known through forming the picturesque waterfalls of Cauldron Snout and High Force in the vale of Tees, as "essentially a manifestation of volcanic action . . . connected with the uprise of basic lava in volcanic orifices," through which "the subterranean energy may quite probably have succeeded in reaching the surface and ejecting there both lavas and tuffs."³

¹ *Op. cit.* vol. i. pp. 372, 373.

² *Ibid.* p. 414.

³ *Ibid.* vol. ii. p. 7.

Elsewhere in England volcanic remains of this period are scattered and scanty. In Derbyshire, to the south of the Peak, volcanic masses known as toadstone are met with in many places, and vents from which this lava was ejected have been discovered at Castleton, Grange Mill (5 miles west of Matlock Bath), Hopton, and Kniveton Wood.¹ But no other volcanic remains of the period are



HIGH FORCE, TEESDALE.

Poulton, photo.

met with till we come to Somerset, near Weston-super-Mare, to the west and north of the Mendip Hills. Others have been found among the Culm Measures of South Devon from the neighbourhood of Launceston to Bovey Tracey. In Ireland remains of volcanoes of the Carboniferous period have been found in King's County and Limerick, and such remains also exist among the Carboniferous deposits at the south end of the Isle of Man.

¹ *Op. cit.* vol. ii. p. 13.

6. Volcanoes of the Permian Period

During the Permian period a series of changes, similar to those which gave rise to the lakes of the Old Red Sandstone, took place in Great Britain, and led to the formation of another set of mostly shallow lakes, but of smaller extent than the earlier ones. How far these extended can hardly be conjectured, however, so largely have these rocks been removed by denudation. In that way the evidences of volcanic action have also been removed even from areas where they may at one time have existed. In some cases, however, there are abundant evidences of Permian volcanoes (mostly in Scotland), and on grounds more or less cogent¹ Sir A. Geikie has referred to the volcanic activity of this period not only extensive remains in Nithsdale, Annandale, and Middle and Northern Ayrshire, but also numerous vents filled with agglomerate and tuff farther north, principally in Eastern Fife, the largest of these being that of *Largo Law*.

In England the only volcanic rocks that "may be referred with some confidence to the Permian period"² are those of Devonshire, between the Torridge and Exeter, as well as in the Exe valley to the north of Exeter, near Tiverton, but even in this case there is a doubt, due to the difficulty in determining the exact age to which the breccias and sandstones with which these remains are associated ought to be referred, the one-inch Geological Survey Maps assigning them, not to the Permian but to the Trias or New Red Sandstone. Still greater doubt attaches to the age of a series of basic eruptive rocks of the Midlands, with regard to which all that can be said is that they are "younger than the Coal-Measures and

¹ *Op. cit.* vol. ii. pp. 55, 56.

² *Ibid.* p. 94.

may possibly be Permian.”¹ The areas in which these are found are Titterstone Clee Hill, Brown Clee Hill, the Forest of Wyre coal-field, the Coalbrookdale coal-field, and the South Staffordshire coal-field.

7. Post-Permian Volcanoes

If the volcanoes that ejected the rocks spoken of in the last paragraph are rightly referred to Permian times, then the whole of the Mesozoic era that followed is, as regards volcanic activity, a period of quiescence. No trace of volcanic remains has been found among the rocks of that era in the British Isles, and only the most insignificant traces on the mainland of Europe. In early Tertiary times, however, volcanic outpourings took place once more, and then on a magnificent scale, great plateau eruptions having then occurred over an area extending from the north of England and Ireland to Iceland. The region within which this seems to have happened in the British Isles, as evidenced partly by the remains of the plateaux themselves, partly by the presence of dykes which may probably be assigned to that age, has an area of about 40,000 square miles. The plateaux of that period still remaining are confined to Ireland and Scotland, but in both countries are of great extent. In Ireland they overspread nearly the whole of county Antrim, with parts of Down, Armagh, Tyrone, and Londonderry, with sheets of basalt, which forms the whole of the northern coast-line from Ballycastle to the mouth of the Bann, and form also the neighbouring Rathlin. It is an upper sheet of basalt that has here formed the remarkable columnar pavement of the *Giant's Causeway*, with the adjacent cliffs extending to Benbane

¹ *Op. cit.* ii. p. 94.

Head and White Park Bay, the pavement being composed of the lowest sheet of this group.¹ In Scotland they cover in the form of basalts or andesites the greater part of the island of *Mull* (all except the end of the south-western peninsula), while constituting some of the smaller islands adjacent, including the well-known *Staffa*; they cover also adjoining portions of Morven and



GIANT'S CAUSEWAY.

Lawrence, photo.

Ardnamurchan, the islands of Muick, Eigg, Canna, and Sanday, part of Rum, and all the broader part of the Isle of Skye, from Lochs Brittle and Sligachan, while the eastern peninsula of Skye is traversed by numerous dykes, which are probably to be referred to the same origin.

The lava by which these plateaux were formed probably flowed out, as in the similar eruptions still

¹ *Op. cit.* vol. ii. p. 206.

taking place in Iceland, either from the lips of long open fissures or from vents formed along the chasms. The fissures, as shown by the dykes by which they are still marked, were opened out as violent rents made with remarkable straightness through rocks the most varied in structure and geological relations. In some places the accumulation of volcanic matter formed by successive outpourings attains even now, after ages of denudation, a thickness of more than 3000 feet.

In England and the south of the mainland of Scotland the corresponding superficial outpourings which probably at one time existed have all been removed by subsequent denudation, but numerous dykes may be taken as evidences of volcanic activity at this period in those regions, just as the great Whin Sill is taken as evidence of such activity during Carboniferous times. These dykes occur in two types. Those of the one type occur singly or in pairs, and are remarkable for their thickness, persistence in one direction, great length, and vertical parallelism of their sides. The most remarkable example of this type is the *Cleveland Dyke*, which begins at Robin Hood Bay on the coast of Yorkshire, runs, with frequent interruptions, with a general direction west, 15° N., through the Cleveland iron district, the valley of the Tees, crossing the Great Whin Sill nearly at right angles, passes under the summit of Cross Fell, and terminating, as far as can be seen, at Dalston Hill, to the south of Carlisle. The whole length is 110 miles, but if dykes that have been traced in the south-west of Scotland, running in the same general line to the coast near Prestwick in Ayrshire, may be regarded as continuing it, then its whole length is brought up to about 190 miles.¹ Dykes of the other type occur in groups,

¹ *Op. cit.* vol. ii. p. 144.

and are generally shorter, narrower, less persistent in direction, and less remarkable for the vertical parallelism of their sides. Besides the dykes in Eastern Skye already referred to, the dykes in Arran, Mull, and Eigg are examples of this type. Nearly all the dykes believed to belong to this volcanic epoch have a general north-westerly trend.

CHAPTER IX

CLIMATE OF GREAT BRITAIN

1. The Broad Features of the Climate

THE broad features of the climate of England, and of Great Britain generally, the moderate range of temperature, the remarkably mild winter temperatures, and the higher rainfall and greater humidity of the western highlands as compared with the lower midland and eastern districts, are too well known to need dwelling upon. It may, however, be well to point out that the last three characteristics are all due to the same cause—prevailing south - westerly vapour-laden winds. From the comparison of sea surface and air temperature observations round the British coasts Mr. H. N. Dickson is led to conclude that “the mere presence of Atlantic water is more effective in depressing the summer temperature than in raising that of the winter months. The mild winters of our western coasts are not due to the heating of the air by contact with a surface of warm water brought by a current from warmer regions . . . but to the fact that the air has itself come from these warmer regions, and is charged with abundant moisture, which sets free vast quantities of heat through condensation. With the south-westerly winds comes

the drift current, and the temperature of the water is higher than that of the air, because both are moving northward, and the specific heat of the water is the greater; but the warmth of the air and of the water are both the result of the prevailing direction of the wind.”¹

It must be remembered that the warmth due to the condensation of water-vapour is carried onwards by the winds even after they have become comparatively dry, and there can be little doubt that the excessive winter rainfall of the western highlands of Scotland has an important effect in neutralising the tendency to a lowering of temperature with increase in latitude both on the west and east, so that during the month of January the same mean temperature extends from Cape Wrath to the Isle of Wight, and only a slightly lower temperature from Inverness to Margate.² On the shores of the Moray Firth we have a striking instance of the result of föhn winds. The air here has, especially in winter, a peculiar mildness, of which it would almost appear that Shakespeare had some knowledge, if we may judge by the words that he puts into the mouths of Duncan and Banquo in approaching the castle of Macbeth at Inverness:—

This guest of summer,
The temple-haunting martlet, does approve,
By his loved mansionry, that the heaven's breath
Smells wooingly here: no jutty, frieze,
Buttress, nor coign of vantage, but this bird
Hath made his pendent bed and procreant cradle:
Where they most breed and haunt, I have observed,
The air is delicate.

¹ “The Mean Temperature of the Surface Waters of the Sea round the British Coasts and its relation to the Mean Temperature of the Air,” in *Quart. Jour. Meteor. Soc.* vol. xxv., No. 112, p. 302.

² Compare Plates 6 and 23 of Bartholomew's *Physical Atlas: Meteorology*.

"Crops will ripen in the valley of the Shin, in Sutherlandshire, in 58° N., which never come to maturity in Argyllshire, two degrees farther south."¹

2. Winter and Summer Temperatures of Great Britain

As illustrating the influence of westerly winds, the course of the winter isotherms of Great Britain is very noteworthy. In the south these isotherms show a fairly rapid diminution of temperature from south to north as well as from west to east, but as we go farther north the direction of the isotherms becomes more and more northerly. If we take those of December in particular, we find that in Scotland the isotherms on the west side trend only about one point west of north, or, in other words, are about parallel to the general trend of the west coast. The diminution of temperature is accordingly almost entirely from west to east. The prevailing direction of the winds being west-south-west, and the winds being, as already indicated, the dominant factor in controlling the temperature at this season, this fact cannot be considered surprising.

In the south of England the rapid lowering of temperature from south to north above mentioned is due to the fact that places on or near the coast are here favourably influenced by the waters of the English Channel. "The part of the British Isles in which the winter climate is most directly influenced by the warm water of the sea is probably the south and south-east coast of England. From October to January the average temperature of the sea is 6° higher than that of the air, and the warm air coming up the Channel passes over a

¹ See *Europe*, vol. i. pp. 47, 454, 499; and R. H. Scott, *Elementary Meteorology*, p. 345.

surface of uniform temperature: the warm water is not in this case brought by the wind, but as it were sent on ahead of it; hence the south coast enjoys a mild sea wind without the saturation conditions experienced on the western coast."¹ This is especially true, as pointed out by Mr. Buchan, on the part of the south coast to the east of Portland, west of which the rainfall rises con-



BEN NEVIS.

G. W. Wilson, photo.

siderably to Prawle Point, and then more rapidly to Penzance.²

During the month of July, the hottest month of the year except at maritime stations, the highest mean temperature, 64° F., is in a small district round London south of the Thames. From this centre the temperature diminishes on all sides seawards, and still more northwards, till on the north coast of Scotland it sinks to about 55° F.

¹ Dickson, *ubi supra*.

² In a paper on "The Mean Atmospheric Pressure and Temperature of the British Islands," in *Jour. Scot. Meteor. Soc.*, Third Series, vol xi. p. 16.

September is the month in which, on the whole, there is the most regular diminution in temperature from south to north in Great Britain, the isotherm of 59° F. then running parallel to and a short distance south of the south coast, that of 53° F. running from the Butt of Lewis to Wick.

3. The Rainfall of Great Britain

As regards rainfall and humidity, while the west, as already stated, has on the whole an excess under both heads as compared with the east,—a fact which has more than one important economic consequence,—there are remarkable local differences in certain parts of the country. This is only what might be expected from the varied superficial configuration combined with the exposure to moisture-charged winds. Of all such differences the most striking, revealed by the returns from the meteorological stations, are in the Lake District. The first three of the stations in the following table lie within about 10 miles of one another in a straight line nearly from south to north, the fourth about 16 miles to the east of the north end of that line.

Station.	Lat.	Lon.	Alt. Feet.	Period.	Rainfall. Inches.
The Stye	64°28' N.	3°12' W.	1077	1881-90	177
Seathwaite	54°30'	3°11'	423	„	131 ¹
Keswick	54°36'	3°8'	270	„	60
Penrith	54°39'	2°46'	575	„	32

The first two of these stations are both situated on the same side of one of the highest passes in the district, the Sty Head Pass (1600 feet), between Wasdale and Derwentdale or Borrowdale. The pass crosses a saddle connecting the knot which includes Sca Fell Pike (3210

¹ Period 1866-90, 136 inches.

feet), Sca Fell, and Bow Fell, on the south-east, with a spur running west from the Great Gable (2949 feet) to the Pillar, Steeple, and Haycock (all above 2600 feet) between Innerdale and Wasdale. Here, accordingly, some of the highest parts of the Lake District are so arranged as to intercept all winds blowing towards the head of Derwentdale from the west, south-west, and



STYE HEAD PASS.

Poulton, photo.

south. With reference to such winds both stations are indeed on the leeward side, but the Stye only about one mile, Seathwaite only about two miles from the head of the pass. In an examination of the rainfall returns of Seathwaite, it has been pointed out by Mr. Marriott¹ that the heaviest falls occur when the wind blows strongly between south-east and west, thus tending to concentrate

¹ *Quart. Jour. Meteor. Soc.* xxiv. (1898), pp. 42-50.

in valleys converging towards this spot air that has swept over the Irish Sea and Morecambe Bay, and thence almost unobstructed to these hilly districts. Here, therefore, the rainfall record is higher than at any other station in the British Isles except the Styne and Ben Nevis Observatory.¹ Keswick is in a hollow sheltered from all westerly and south-westerly winds, but, on the other hand, has a fairly high rainfall promoted by the rise of Skiddaw (3054) and Saddleback (2847 feet) immediately behind the village with respect to south-westerly winds. Penrith, finally, lies to the north-east of the whole Lake District, in the valley between it and the Pennine Chain.

In all parts of Great Britain, and indeed of the British Isles, the second half of the year is on the whole wetter than the first half, but in the highland districts in the north-west, including the Lake District of England, January is included in the wet months. In every part of the British Isles the driest month is one of the first six, in most parts the wettest one of the remaining six. In the eastern lowlands generally the dry season is from January to May.

4. The Climate of England in Past Times

One would be glad to have definite data indicating whether the climate in ancient times was in any way different from what it is now. It is at least interesting to find that the distinctive characteristics noted by the earliest ancient writers who give an account of Britain are precisely those which are noteworthy at the present day. Cæsar says "that there are places in Britain more

¹ See particulars with regard to this district illustrated by maps also in Symons's *British Rainfall*, 1896.

temperate than in Gaul, from the difference in the degree of cold.”¹ Tacitus notes that in this island “there is no intense cold,” and adds that “besides the olive and the vine and other fruit-trees natural to warmer climates, the soil produces corn in considerable quantities, which, however slow in ripening, springs up apace; both which circumstances are owing to the same cause—the great moisture of the ground and air.” “For the air here (according to that remark of Strabo) is more apt to produce rain than snow.”² Again, a panegyrist³ of the Emperor Constantine exclaims, “O fortunate Britain . . . Nature justly bestowed on thee all the advantages of the air and soil; with thee, neither the cold of winter nor the heat of summer is excessive.” The same panegyrist remarks on the great length of the days: “no nights without some gleams of light are thine; the level extremities of this country not making any shade . . . so that the sun himself, who appears to us to set, seems there only passing by.” As to the differences in the length of night and day Cæsar not merely mentions what he learnt by report, but states that he ascertained by observations made with water-clocks that the (summer) nights were shorter than in Gaul in the parts which he visited. The warmth of the sea is specially noted by Minucius Felix.

In reading these accounts by ancient writers we must keep in mind the temperatures with which those of Britain would be compared. It is not merely Rome that would enter into the comparison. The ancients were, of course, perfectly familiar with the general lowering of

¹ *De Bello Gallico*, v. 13.

² *Vita Agric.* 12. The translations, with the other particulars here given from ancient writers, are taken from the Introduction to Camden's *Britannia*, Gough's ed., 1789.

³ Eumenius.

temperature from south to north. In Italy they would have more reason to be familiar with it than we in England, for the differences due to latitude are much greater in the peninsula than in the island. Accordingly they would take that general lowering of temperature northwards into account in forming their estimate of the climate of Britain. Naturally, therefore, Cæsar, who was well acquainted with the temperature of Northern Italy and different parts of Gaul when he visited Britain, was struck with the comparative mildness of climate which he experienced there. For, while at Rome the winters are milder than in England, the mean January temperatures of places in Northern Italy, such as Bologna, Milan, and Turin, and places in France, even in the sheltered Rhone valley, like Lyons, are several degrees lower than those not merely of the southern parts of England, which alone were visited by Cæsar, but even of the extreme north of Great Britain. The mean January temperature of Aquila, the ancient Amiternum, which lies only a short distance from Rome, though it is true at the height of upwards of 2000 feet, is under 35° F., or more than four degrees below that of London. And if we consider not means but the recorded minima, we find that within thirty years a minimum of zero Fahrenheit has been recorded at Alessandria and one of 4° F. at Turin, as against 6.7° F. at London.¹

This last point may be noted in connection with the observations of Tacitus that there is no intense cold in Britain, and that the olive, as well as the vine, and other fruit trees natural to warmer climates can be grown there. Severe cold is nothing to the vine, but with

¹ This shade temperature was recorded at Camden Square in 1860 and in 1867, and none so low down to 1900 inclusive (*Meteor. Mag.* May 1901, pp. 62, 63).

respect to the olive it is worth while to note that it will not stand the cold of the plains of Northern Italy except at places immediately under the shelter of the Alpine wall. Eumenius adds that as there is no intense cold, neither in summer is there excessive heat; and this is one of the most notable of all the contrasts to the climate of Italy, for at the very places at which a mean January temperature several degrees below that of any station in England, the July temperatures are 10° to 12° or more degrees higher—at Bologna and Turin about 74° F., at Milan 77° ; even at the elevated station of Aquila nearly 73° .

The observation of Tacitus as to the rainfall indicates another marked contrast between England and Italy, and more particularly Southern Italy. The corn, he says, ripens apace on account of the great moisture in the ground and air. We may take this as referring to the summer months, the growing months for corn—say June to August. Now in Italy these months are for the most part comparatively dry, and this is especially true of the southern half. From Rome southwards the total mean rainfall for these three months does not exceed $3\frac{1}{4}$ inches at any of the stations included in the Statistical Annuary of Italy. In the more southerly stations the total is below 2 inches, and in Sicily, in the time of Tacitus one of the great granaries of Rome, it is below 2 inches for the aggregate of the four months, May to August. Compare even the drier corn-growing parts of England at the present time. The stations of Canterbury St. Albans, Dunmow (23 miles west of Colchester), and Alton (13 miles east-north-east of Winchester) may be selected as representative of this part of Roman Britain, and at these the rainfall for the three summer months varies from about 6 inches (Canterbury) to more than 8 inches (Alton).

Finally, we may notice the remark of Strabo, that in Britain the air "is more apt to produce rain than snow." Italy is not a country in which snow is very frequent, still, notwithstanding the difference of latitude, we find that on the average of three consecutive years snow fell on ten days at Bologna and Turin, on eight days at Milan, and on thirty-one days at the elevated station of Aquila, not far, as already mentioned, from Rome.

Altogether the correspondence between the observations of the ancients made without instruments and those made in modern times by scientific measurement is very striking.

From such statements as that made by Tacitus as to the growing of the olive and the vine in England, it has been argued by some that the climate of England must have changed for the worse since Roman times, or even since a much later date. But the reasons for any such belief are very slender. We are not to suppose from what Tacitus says that, though the olive would grow in Roman Britain, it would flourish there and ripen its fruit freely. It will still grow in England, and on a Devonshire wall looking southwards it can even be coaxed to mature its berries, and there is nothing in what Tacitus says to compel the inference that in Roman times it did anything more. No doubt the Romans liked to see their native trees and shrubs and smaller plants growing round their villas in distant parts of the empire, just as we like to see ours growing in our new homes in Canada, Australia, and South Africa, and even in temporary exiles in India and Ceylon. The Romans in Britain—that is, in its southern parts—could secure for themselves that satisfaction in the case of the olive.

As regards the vine the case is different. We know that it used to be grown for wine-making in many parts

of England. Prof. Thorold Rogers, in speaking of the making of wine from English-grown grapes in the fourteenth century at Ditchingham in Norfolk, suggests¹ the inference from the cessation of this practice that the climate must have become colder. But he elsewhere² quotes one Barnaby Googe, writing in 1577, as stating that "a right good wine" had lately been made from a vine growing at Nottingham; and again³ he quotes from Hartlib's *Legacy of Husbandry*, 3rd edition, 1655, the statement that Sir Peter Ricaud, of Great Chart in Kent, apparently about that date, yearly made from 6 to 8 hogsheads of wine from vines of his own growth. So that if we may infer any change of climate on this ground, the change must have taken place within the last two hundred and fifty years. Now, of any such change within that period there is no other evidence. On the contrary, the indications as to the climate of Europe generally derived from the cultivation of the vine are precisely those of which we have the longest and fullest record. The date of the vintage in different years is known as far back as 1391, and from these records there is no reason to infer any continuous change in the climate of Europe since that date.⁴ That in itself makes the supposition of any such change in England (which is outside the range of these records) very unlikely. Besides, the argument in itself is of very little weight. It would be just as reasonable to infer a change in the climate of England within the last forty years from the fact that within that time the wheat area of the country has diminished by more than one-half.

¹ *Agriculture and Prices*, vol. i. p. 29.

² *Ibid.* vol. iv. pp. 293, 294.

³ *Ibid.* vol. vi. p. 58.

⁴ See Brückner, "Die Klimaschwankungen seit 1700," in Penck's *Geographische Abhandlungen*, vol. iv. pt. 2 (Vienna, 1890), more particularly pp. 261-267.

Obviously what extinguished wine-making in England was the growth of trade with wine-growing countries, from which wine could thus be got both better and cheaper. Even at the present day, it must be remembered, wine is made from grapes grown in the open air in Glamorganshire, and this wine, we may assuredly believe, much better than that "right good wine" made by the lady of Nottingham in the sixteenth, or by Sir Peter Ricaud in Kent in the seventeenth century.

On the other hand, a change for the better in the climate of England since Roman times has been inferred as probable from what we know to have been the condition of the country at that date, and in this case it may be admitted that the argument is of greater validity, though what it proves amounts to very little. We know that in the time of the Romans the country was to a large extent covered with forests and marshes, which only gradually got cleared and drained, and from this it is concluded that the climate must have been in consequence both more humid and colder. There is a very general opinion that the presence of forests even without marshes tends to bring about both these effects, but how far this opinion is correct is by no means certain. Probably no question in physical geography has been more carefully examined in recent years, but it cannot be said that the facts have yet been made quite clear. So much, however, has at least been ascertained, that the effects of the presence of forests even of great extent, whether on rainfall or temperature, are in the cultivated parts of the temperate zone very small. In an uncultivated or imperfectly cultivated country like ancient Britain, their effects, whatever they might be, would be sure to be combined and confused with those of marshes and wet undrained lands. To these some

effect must undoubtedly be ascribed. They must have increased to some extent the humidity of the atmosphere, but whether they had, in consequence of that, any marked effect on the rainfall is not so certain. The best case to take in order to judge of the effect of marshes on rainfall is that of the vast marshes of the Pripet in Western Russia, a region for which we have the rainfall maps of Wild, and these maps show no increase of rainfall in any season in the region of these marshes. There may, however, have been a decided increase of the humidity of the atmosphere, so as to affect its transparency and its power of influencing the human body without any marked effect on the rainfall; and if there was such an increase, no doubt it would have some effect also on the temperature. What the final effect of that kind would be, however, is not easy to guess. On the one hand, more heat would be consumed in converting moisture into water-vapour, and thus lost for the raising of the temperature. But, on the other hand, the increased humidity of the atmosphere would tend to diminish the nightly loss of heat by radiation. Altogether these effects of marshes would be strictly local, and probably, on the whole, slight. They would, it is likely, render the climate in places decidedly more unpleasant than it now is, but would not appreciably affect the characteristics of the climate with respect to vegetation. For, while we cannot deduce from the statement of Tacitus as to the products of Britain in Roman times any inference as to the deterioration of climate since those days, we may confidently appeal to that statement as proving that the climate of Roman Britain cannot have been appreciably worse than the present.

Ekholm contends that "a review of the historical

reports during the last thousand years has led with some probability to the conclusion that a climatic variation is going on from a more continental to a more maritime climate in the north-west of Europe, especially in Scandinavia and Great Britain"; but adds that "the character and cause of this variation are unknown,"¹ and the facts adduced do not seem to indicate that the variation has been great in amount.

¹ "On the Variations of Climate," *Quart. Jour. Meteor. Soc.* xxvii. (1901), p. 60; see also p. 52.



CHAPTER X

ENGLAND AND WALES—RIVERS AND LAKES

1. General Considerations

THE present short chapter, so far as it relates to rivers, is chiefly concerned with the rivers of historical times, our main point of view being here as elsewhere the influence of the geography on the development of the people. It is, however, a familiar fact that the rivers and their valleys of the present time are not those of the geological past, and there has been much interesting observation and speculation on the various causes that have resulted in some of the more important features of the drainage system of England and Wales as they now exist. For details on this head the reader is referred to the works and papers cited below.¹ Here space can be spared only for a few general observations. The general water-parting, as may be seen on the accompanying map,

¹ A. C. Ramsay "On the River-Courses of England and Wales," in *Quart. Jour. Geol. Soc.* xxviii. (1872), p. 148; Topley, *Geology of the Weald* (Memoirs of the Geological Survey of Great Britain), pp. 160-204; Jukes-Brown "On the Relative Ages of Certain River Valleys in Lincolnshire," in the *Quart. Jour. Geol. Soc.* xxxix. (1883), p. 596; Prof. W. M. Davis, "The Development of Certain English Rivers," in the *Geol. Jour.* v. (1895) p. 127; H. J. Mackinder, *Britain and the British Seas* (1902); and Lord Avebury, *The Scenery of England and the Causes to which it is due* (1902).

is much nearer the west than the east side. As the west is that which is exposed to the rain-bearing winds from the Atlantic, the work of erosion, under otherwise similar conditions, is necessarily going on, and in all probability for a prolonged geological period has gone on with much more energy on that side than on the east. The water-parting has accordingly gradually crept eastwards. An illustration of this fact is afforded by the history of the Thames, which now has its source in the Cotswold Hills between Cheltenham and Cirencester, but at one time probably rose to the west of the present line of the escarpment forming the western edge of those hills. This and similar escarpments, such as that of the Chalk in the Chiltern Hills, are gradually retreating eastwards in consequence of the action of denuding agents on these steep slopes; but the effect of such actions on the rivers of the region may differ in different cases according to the nature of other processes going on at the same time. In many cases the rivers that began to flow over the surface of the rocks to which those escarpments belong, or even over later deposits that have been long since cleared away, have worn a passage for themselves to a level below the base of the present escarpments before these escarpments were formed, and continue still to flow in these old beds. Hence it is that so many flow through gaps in such escarpments in whatever direction the escarpments may run. Thus it is that the Thames passes through the Chalk between the Chiltern Hills and the Ilsley Downs, as shown on the geological map of the south-east of England between pp. 90 and 91, and, as already stated (p. 105), so many rivers of the Weald break through the North and South Downs. There can be little doubt that these last rivers began to run when the chalk area was

elevated into a great anticline sloping northwards and southwards so as to give the rivers the direction which they still retain.

But over against this evidence of persistence in river-beds there is other evidence which in some cases amounts to a demonstration, in others establishes the great probability of changes which have brought about the transference of a portion of one river with its valley to another. It is obvious that differences in the degree of hardness of the rocks acted on and other causes must bring about a lowering of the beds of neighbouring rivers at different rates, and hence it may often happen that one river "eats back its head" so rapidly as ultimately to tap some adjoining river, and cause its water to flow in a different and sometimes an opposite direction. In this way Jukes-Brown¹ has given good grounds for believing that the Trent once flowed through the gap in which the Witham still pierces the Lincoln Heights, and that the present river has been formed by the capture of the upper part of this stream by another flowing northwards in the bed now followed by the lower Trent. Davis, Mackinder, and Lord Avebury all believe that the present headstream of the Severn was at one time that of the Thames. Other examples have been suggested above (pp. 105, 106) in the Wey and the Mole. In many cases the lower courses of streams that have thus been tapped have lost their water, and dry beds filled with alluvium remain to show where streams once flowed. On the map above referred to, showing the geology of the south-east of England, such dry beds (whatever their origin may be²) are shown near Wendover in the Chilterns (where more than one attains a depth of about

¹ *Ubi supra*, pp. 606-610.

² On this point see Marr, *The Scientific Study of Scenery*, p. 153.

300 feet) and at the Croydon breach in the North Downs.

2. Principal Rivers of England and Wales

	Length.	Area of Basin.
	Miles.	Sq. Miles.
Tyne	80 (N. Tyne)	1130
Wear	67	456
Tees	85	708
Ouse ¹ (Yorks.)	57 ²	4133
Trent ¹	170	4052
Witham	80	1079
Welland	70	760
Nen	90	1077
Great Ouse	160	2607
Yare	60	880
Stour (Suffolk and Essex)	60	407
Thames	210	5924 (including Medway)
Medway	44	680
Severn	210	5959 (including Wye)
Wye	130	1609
Dee	70	813
Mersey	70	1596
Ribble	65	585
Eden	69	1300

3. Rivers of the North-East

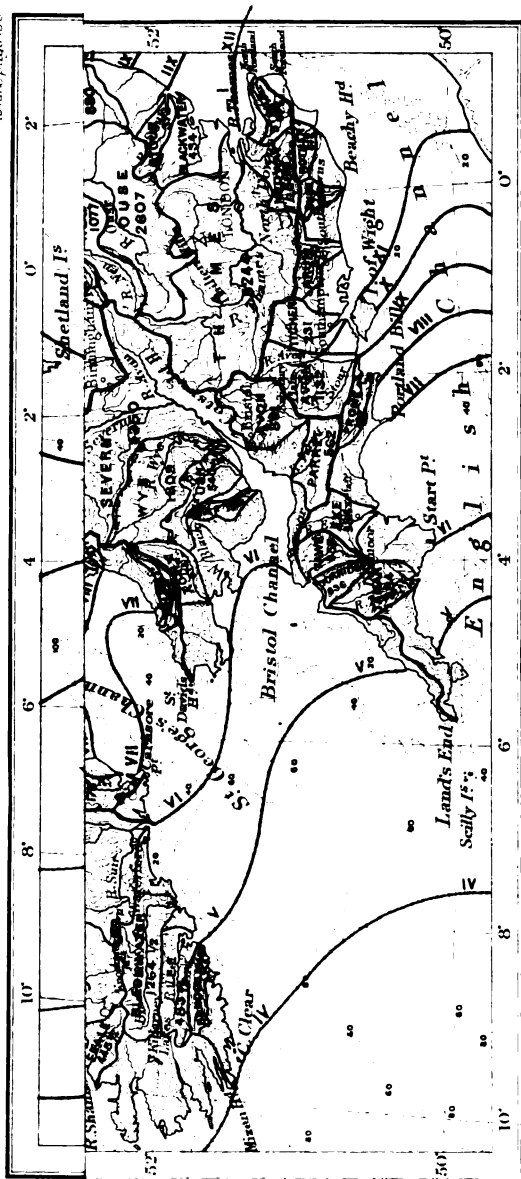
All the rivers of the north-east of England from the Tyne to the Trent, with the great majority of their tributaries, take their rise in the elevated series of Carboniferous rocks extending from the Cheviots to the middle of England. Their headwaters accordingly flow for the most part through deep and narrow dales, in some places

¹ Total area of Humber basin, 9293 square miles.

² From confluence of Swale and Ure, the length of each of which is about 60 miles.

WATERSHED MAP OF THE BRITISH ISLES

Totter page 186



SCALE OF ENGLISH MILES

London: Edward Stanford, 12, 13 & 14, Long Acre, W.C.

Stanfords (reg) Embs London.

well wooded and picturesque, in others bare and even forbidding. We have already seen (pp. 76-78) that the rocks of this system—limestones, shales, and millstone grits—offer different degrees of resistance to weathering agents. The result in many of the river-beds has been sudden changes of level giving rise to numerous falls. It has also been already pointed out (p. 161) that the intrusion of the Great Whin Sill has likewise contributed to this characteristic. Many of these north of England falls are strikingly analogous to that of Niagara though on a miniature scale. "There is the same succession of rocks giving rise to the fall, the same evidence of recession in the position of the fall, the same process of undermining and breaking down the overlying limestone through the erosion of a shale beneath, assisted by the action of the water and frost in the joints of the upper rock. . . . One of the best illustrations is that of *Ashgill Force* on the Ashgill, a tributary of the Tyne. After flowing with a gentle current from the south-east, the stream suddenly precipitates itself over the Scar Limestone in a cascade some 70 feet in height, and the increased velocity of the water has enabled it to cut a passage for itself of not less than 90 or 100 feet in depth for a considerable distance through the limestone. As at Niagara there is a terrace behind the fall, the terrace resting in this case on some grey beds of soft sandstone, interposed between the limestone and the shale.

"In Yorkshire similar examples are very common, and above all in the Yoredale series of rocks, the essential character of which . . . consists in an alternation of limestones, gritstones, and 'plates' (a local name for beds of shale). The consequence of this structure is, that waterfalls are found in all the dales, and nearly all

the lateral valleys, where that series occurs. They occur, that is to say, in the course of the Tees, the Swale, the Yore [Ure], and the Wharfe, and many other streams flowing more or less east to west from the backbone of England; but it is in Wensleydale [the upper valley of the Ure], where the Yoredale series is most complicated, that the waterfalls are 'most frequent, varied, and interesting.' In that dale, for example, occurs the *Hardra Force*, an instance very similar to the Ashgill Force, with this difference, however, that in the former a tolerably thick bed of sandstone intervenes between the shale and the limestone"¹ The fall here descends in one leap a height of 80 feet from the middle of a horse-shoe of rock, and the terrace behind the fall allows of visitors passing from one side to the other hardly touched by a drop of water.

It need hardly be said that in these dales the rivers are not navigable, but all the mouths of the rivers are so, and have given rise to important seaports. The rivers of the Humber basin have also provided at all times access to the interior of the Great Vale of England, and were among the earliest of English rivers to engage the attention of the Crown and Parliament, with a view to preserving and improving this gift of nature. As early as 1462 the Lord Mayor and aldermen of the city of York were appointed conservators of the *Ouse*, *Aire*, *Wharfe*, *Derwent*, *Dunn*, and *Humber*. In 1657 an Act was passed for amending the navigation of the *Ouse* in the neighbourhood of York. An Act of 1767 states that the river had already been improved as high as

¹ From a paper by the author on "Rapids and Waterfalls," in the *Scot. Geog. Mag.* 1885, pp. 410, 411, referring to Phillips's *Illustrations of the Geology of Yorkshire*, Part ii. pp. 170, 171. See also Marr, *The Scientific Study of Scenery*, pp. 147-152.

Linton (about two-thirds of the distance from York to the confluence of the Swale and Ure), and provides for the continuation of the navigation up the remainder of the Ouse and up the Swale and Bedale brook to Bedale. The *Aire* and *Calder* were made navigable to Leeds and Wakefield respectively under an Act of 1699 (see below p. 412). The (Yorkshire) *Derwent*, on the left bank of the Ouse, was made navigable to New Malton under an Act of 1701.

That the *Trent* was a navigable river at least as high as Nottingham at the close of the eleventh century is proved by the fact that in Domesday a fine is imposed on any who should hinder the passage of ships there. In 1699 the first Act for improving the navigation was passed, but little pains seem to have been taken to make the improvements effective, for shoals were afterwards frequent in dry seasons. In 1770 another Act was obtained for improving the navigation from Wilden Ferry just above the junction of the (Derbyshire) *Derwent*, which was fixed on as the point of junction of the Trent and Mersey (Grand Trunk) Canal, an Act for which had been obtained four years previously. Since that time Wilden Ferry has been the practical limit of Trent navigation, 94 miles above the mouth of the river. Of this stretch only 68 miles have the navigation regulated by the company created under this Act, the remaining 26 miles, from Gainsborough downwards, being free. Before the construction of the Trent and Mersey Canal the river navigation was important for 23 miles higher up, as far as Burton-on-Trent, which is now connected by a short branch with the canal mentioned.

4. The Rivers of the Wash Basin

There is abundant evidence to show that these rivers were of great importance in the early history of England as well as later down to the time when water-carriage was so largely superseded by railways. The magnitude of the *Witham* navigation as high as Lincoln at the date of Domesday may be safely inferred from the fact that in that record Torksey is mentioned as a place with "two hundred burgesses enjoying not a few privileges, upon condition they should conduct the king's ambassadors when they came this way in their boats down the Trent, and bring them as far as York." Though Torksey is situated on the Trent (Lincolnshire side) the importance that it long possessed is due to the fact that that river is there connected with the Witham at Lincoln, by a canal known as the Foss-dyke, which was probably originally dug in Roman times, although in its present form it dates only from the time of Charles II. The first Act for the improvement of the Witham navigation, passed in 1671, refers in the preamble to the "good navigacioun" that had existed for "some hundred of years" betwixt the borough of Boston and the river of Trent by and through the city of Lincoln. At the present day the Witham is navigable from Lincoln downwards for boats of about 5 feet draught.

With regard to the rivers of the fen country the reader is referred to a previous chapter on that subject (especially pp. 128-132); but here it may be added that of all these rivers south of the Wash, the most important as a waterway has always been the *Great Ouse*, which now affords navigation as high as Bedford, and by

its tributaries with Shefford, Cambridge, Bury St. Edmunds, and Brandon. It may be conjectured that Stourbridge, immediately adjoining Cambridge, the seat in former times of one of the greatest fairs in England, —a fair that survived down to the eighteenth century, —owed that importance to the fact that this system of waterways was there brought so near to London.

5. The Rivers of the South-east and South

There cannot be the slightest doubt that the navigation of the *Yare*, which is tidal up to Norwich, must have given importance to that city from the earliest period of English history. Farther south it is chiefly the estuaries and mouths of the rivers that have had much value as waterways until we come to the *Thames*. The whole of this river from London downwards forms the port of London, whose commerce is considered in a later chapter. The length of the continuous navigation of the Thames above London, however, has varied at different times, and there is no English river for the improvement of which so many ordinances have been issued and Acts of Parliament passed. In the fourteenth and fifteenth centuries, and even as late as 1541, the limit of navigation, so far as can be ascertained by the researches of Professor Thorold Rogers, appears to have been Henley. Afterwards for about seventy or eighty years it was Burcot, a hamlet about a mile and a half from Dorchester. In 1677 Yarranton speaks of Lechlade, the present limit of navigation and the place of junction with the Thames and Severn Canal, as the highest point reached by boats, but an Act of 1730 refers to the navigation as extending as high as Cricklade.

The Kent *Stour* was navigable to Canterbury down to comparatively recent times.

On the south coast the mouth of the *Rother* long had importance in connection with the famous Cinque Ports of Winchelsea and Rye, the fortunes of which are referred to in a later chapter (pp. 353-355). The *Ouse*, which still has an important seaport (Newhaven) at its mouth, has had its navigation improved under various Acts since 1847, and the navigation of the *Arun* was sufficiently important at one time to be connected by a canal (now derelict) with that of the Wey at Godalming. The *Itchen* was probably navigable to Winchester at a very early date, if not from the earliest times. Professor Thorold Rogers found evidence of its being navigated in the fourteenth century; but its present navigation to Winchester dates only from the reign of Charles II., an Act having been obtained in 1662 for the purpose of making it navigable. The ship-canal at the mouth of the *Exe*, admitting vessels of 300 tons, was constructed under an Act of 1829.

6. The Rivers of the West

Acts were passed for the improvement of the *Severn* navigation as far back as 1503 and 1531-32. In 1677 Welshpool is stated as the head of the navigation by Yarranton, and that continued to be the limit of navigation for long after. In 1772 an Act was passed for making and maintaining a towing-path between Bewdley and Coalbrookdale, and this last point is now the highest to which the river is actually navigated. In recent times, however, great improvements have been made in the navigation of the river below Worcester, up to which city the river is now available for vessels of 400 tons burden. Below Gloucester the Berkeley Ship-

Canal, begun under an Act of 1793, but subsequently greatly improved; enables vessels of as much as 230 feet in length, 33 feet beam, and of as much as 16 feet draught to ascend to Gloucester, and enables all vessels to avoid the tortuous and dangerous passage naturally afforded by the river below that city.

From the preamble of an Act relating to the navigation of the (Worcestershire) *Avon*, it appears that that river was navigable up to Stratford for a considerable time before that date.

The vicissitudes of the *Dee* have at different times greatly affected the fortunes of Chester. The river, which is described by Camden as seeming rather to rush than run from Wales, brings down from the mountains large quantities of eroded matter. But before reaching Chester its course is checked, and it flows gently through its own alluvial deposits. The regularly expanding estuary into which it flows causes its flow to be still further slackened, and thus promotes increased deposition, which constantly tends to choke the navigable channel in spite of the action of the tide. That the navigation of this river to the sea was the chief cause of the importance of the Roman foundation of *Deva Castra*, the present Chester, there can be no doubt. That it continued to be an important seaport long after the time of the Romans is shown by the following passage quoted by Camden from a writer of the eleventh or twelfth century, one Lucian the Monk. "Our Chester," says Lucian, "is further by the divine favour enriched and beautified by its fair river well stocked with fish running under its walls, and on the south side serving as an harbour of ships from Aquitaine, Spain, Ireland, Germany, which, by the guidance of Christ, and the industry and prudence of the merchants, supply and refresh the heart

of the city with various goods." In Camden's own time, five hundred years later, the sea, "as if offended at certain mills on the bed of the Dee," had "gradually withdrawn itself, and deprived the citizens of their antient and convenient harbour." Under the direction of Yarranton in the latter half of the seventeenth century, a new channel for the river was cut, and a large tract of land recovered from the sea. These works, however, seem not to have been permanently effective, and in 1700 an Act was obtained to enable Chester "to recover and preserve the navigation of the river." A further Act was obtained for the purpose in 1734. The present cut by which the river runs from Chester to the head of the estuary for the greater part of the way in a perfectly straight line was then made, and was opened in April 1737. Vessels of 350 tons were thereby enabled to come up to the quays and warehouses of the city. The port at the present day is nevertheless quite insignificant, such vessels serving to only a very small extent the requirements of modern commerce.

The *Ribble* is another waterway which has declined in relative importance since Roman times except at the mouth. The port of Preston is now the limit of navigation, but the Roman remains at Ribchester, several miles higher up, make it probable that in those times that place was the port of this river.

Possibly too the *Eden* was navigable in Roman times as high as Carlisle, which occupies the site of their station of Luguwallium; but the selection of this site may have been due to nothing else than the strong natural defences afforded, as pointed out by Camden, by the Eden, Petterill, and Caude (Caldew). Neither Leland nor Camden says anything of the navigation of the Eden. An Act to make this river navigable to Carlisle was

obtained in 1721, but when the Carlisle Canal to Port Carlisle adjoining Bowness was constructed about a hundred years later, the river was deserted. Even this canal is now derelict, and the shipping of the port of Carlisle is confined to the Solway Firth.

7. Lakes

There are three groups of lakes in England and Wales: first, that of Cumberland, Westmorland, and North Lancashire; second, that of North Wales; and third, that of the broads of Norfolk and Suffolk. The first two are similar in character. They are drowned portions of mountain valleys, rock-basins the discussion as to the origin of which has been briefly set forth in vol. i. pp. 28-30. Here it is enough to say that if they were not hollowed out by ice, they are at least admitted to have been preserved by the ice of the glacial epoch from being filled up by the products of denudation. The first group is the most important, and has been surveyed by Dr. H. R. Mill and his assistants, and fully described and illustrated by maps and sections in the *Geographical Journal*.¹ The lakes lie in nine great radiating valleys whose centre of radiation is four or five miles to the north-east of Sca Fell. In two valleys the lakes lie in pairs, one above the other, the two lakes in each case being separated by perfectly flat alluvial land deposited by streams flowing in from the side, and thus breaking into two lakes originally one. *Bassenthwaite Lake* has thus been severed from *Derwentwater* by the deposits of the Greta and Newlands Beck, and *Crummock Water* from *Buttermere* by those of the Mill Beck. In *Ilwaco Water* a like division has nearly been made by

¹ "Bathymetrical Survey of the English Lakes," *Geog. Jour.* vol. vi. pp. 46-73, 133-166.

the delta of the Measand Beck. In other cases such deposits are still subaqueous, and have served so far merely to divide two deeper portions of a lake from one another. The fact that the shallower portions of these lakes are generally to be found at the lower ends is explained by Mr. Heawood, one of the collaborators of Dr. Mill, as a natural result of the radial arrangements of the lakes. This involves to some extent a progressive widening of the drainage areas from the centre outwards, and the wider the drainage area, the greater, other things being equal, the amount of matter brought down for deposit.

“The fact that the lakes as a whole reach just as far as and no further than the beginning of the more level country which skirts the district, is in one way merely an extension of the principle of the shallowing at their lower ends. The same fact also shows that they are not held back by anything like a dam thrown across a narrow valley, for in some cases we should have to traverse the level country for miles before reaching a point as low as the deepest parts of the lakes, in several [as shown by the following table three] cases considerably below sea-level.”¹

TABULAR STATEMENT OF STATISTICS OF THE LAKES OF THE ENGLISH LAKE DISTRICT

In all cases except Thirlmere the particulars furnished in the table opposite are those derived from Dr. Mill's survey as given on p. 162 of the *Geog. Jour.* vol. vi. As, at the time of the survey, Thirlmere was in process of being deepened by the Manchester Water Works Department it was not included in the survey, but the figures here given were kindly furnished to me by one of the officials of that department.

¹ *Geog. Jour.* vol. vi. p. 166.

NAME.	Length. Miles.	Breadth. Yards.		Mean Breadth per cent of Length.	Eleva- tion of surface above sea- level.	Depth.			Area. Sq. Miles.	Volume. Million cubic feet.	Drainage area of land.	
		Max.	Mean.			Feet.	Mean per cent of Max.	Total in sq. miles.			Ratio to area of lake.	
Windermere	10.50	1610	950	5	130 ²	219	78½	36	5.69	12,250	88.65	15.5
Ullswater	7.35	1100	827	6½	476	205	83	40	3.44	7,870	55.95	16.3
Wastwater	3.00	880	650	12	200 ²	258	134½	52	1.12	4,128	18.64	16.7
Conistone Water	5.41	870	600	6½	143 ²	184	79	43	1.89	4,000	23.34	12.4
Crummock Water	2.50	1000	700	16	321	144	87½	61	0.97	2,343	16.80	17.3
Ennerdale Water	2.40	1000	800	19	368	148	62	42	1.12	1,978	16.95	15.1
Bassenthwaite Water	3.83	1300	950	14	223 ²	70	18	26	2.06	1,023	91.51 ³	44.2
Derwentwater	2.87	2130	1270	25	244 ²	72	18	25	2.06	1,010	31.83	15.4
Hawes Water	2.33	600	405	10	694	103	39½	38	0.54	589	11.20	20.7
Buttermere	1.26	670	620	28	329	94	54½	58	0.36	537	6.50	18.0
Thirlmere ¹	2.93	625	270	...	533	...	...	...	0.51	...	...	...

¹ Dimensions before deepening by Manchester Water Works.² Depths determined at time of sounding ; other depths $\pm$ 2 feet.³ Excluding Derwentwater and Thirlmere drainage areas ; including these, 131.2 square miles.

The lakes of North Wales are most numerous in the semicircle on the north of Snowdon and Moel Siabod in Carnarvonshire, but they extend also into the adjoining counties of Denbigh and Merioneth as well as the north-west of Montgomeryshire, where Lake Vyrnwy lies in the valley of one of the head-waters of the Severn. A large number of them are small round tarn-like lakes, but the most important are elongated exactly like those of the English Lake District. The valleys which they occupy run in two directions at right angles to one another, south-west to north-east, and north-west to south-east. The longest and largest (apart from the artificially formed Lake Vyrnwy, pp. 440, 441) is the beautifully situated *Lake Bala* or *Llyn Tegid* at the head of the valley of the Dee, and about the middle of that line of valleys extending in a north-east to south-west direction from Corwen to the mouth of the Mawddach, in which the water-parting between the Dee and Mawddach is crossed at the height of only 760 feet above sea-level. The length of this lake is three-and-a-half miles, and its breadth almost throughout a little more than half a mile. Next in length is *Llyn Padarn*, to the north-west of Snowdon—a lake now nearly two miles, but formerly more than three miles in length, having been divided into two, like Derwentwater and Bassenthwaite, Buttermere, and Crummock Water, by alluvial deposits brought down by a side stream. The upper lake thus formed, *Llyn Peris*, lies immediately below the *Pass of Llanberis*, which probably contains the most remarkable assemblage of glacial remains, in the form of moraine heaps, perched blocks, and *roches moutonnées* to be met with in the British Isles.

The *broads* are of a totally different character from the lakes of these two groups. They lie in the flat

district lying about the lower courses of the Yare, Bure, and Waveney, and are extremely shallow lakes bordered by extensive reedy marshes. They are due to expansions of the rivers in consequence of the obstruction caused by the alluvial deposits at their mouths. The largest boats by which most of them can be navigated are only of about four feet draught. About a score of broads of various size and characteristically irregular shape occur within a direct distance of about seven miles on the banks of the Bure from Wroxham downwards. Fish and waterfowl abound, and *Wroxham Broad*, which has the reputation of being "the queen of the broads," adds to the picturesqueness to which it no doubt owes that title the attraction of free fishing.

CHAPTER XI

EARLY INHABITANTS OF BRITAIN

1. Prehistoric Changes in Climate

IN the ninth chapter we came to the conclusion that there is no evidence of any important change in the climate of England within the historic period. It is otherwise if we go back to a prehistoric age. It has long been a familiar fact that since the last of the deposits classed by geologists as Tertiary extensive areas in the temperate zones have been covered with sheets of ice. The phenomena of these post-Tertiary ice-sheets are still the subject of investigation for a numerous band of men of science, but so much at least is now generally admitted, that in post-Tertiary times ice-sheets have advanced and retired more than once, the deposits dating from the periods of advance being separated by others indicating a milder climate—in some cases a climate milder than that of the present day. All glacialists are now agreed in recognising at least three such Ice Ages,¹ separated by two interglacial periods; some maintain that there are evidences of more. In any case it is in one of the undoubted interglacial periods that man is first known

¹ That is, late Tertiary or post-Tertiary Ice Ages; the question of the occurrence of Ice Ages in previous geological epochs does not fall under our consideration.

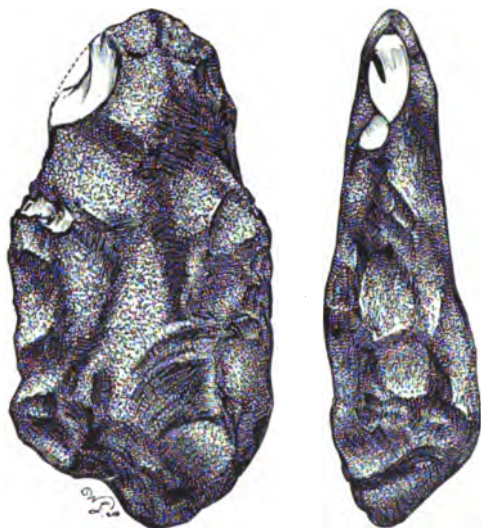
of a surety to have appeared in England or anywhere else.

Of the first Ice Age the evidences in England are scanty. They consist chiefly of the Arctic molluscan fauna of the Chillesford Clay (near Oxford in Suffolk) and the Weybourn Crag in the north-east of Norfolk. The first interglacial period is represented by the deposits of the Forest Bed of Cromer, at the point where the coast of Norfolk begins to tread south-east. It is named from one of its characteristic mammals, the *Elephas meridionalis* period. The second is the Great Ice Age in a special sense, the ice-sheet having then attained its greatest dimensions in area and thickness. In England it advanced to the Bristol Channel, and in the east almost to the Thames. From it is derived the lower boulder clay of the British Isles generally.

2. Palæolithic Man

It is subsequent to this Ice Age that unequivocal traces of man are first met with. In the deposits formed during the prevalence of the milder climate of the second, or *Elephas antiquus*, interglacial period the traces of man are numerous and unmistakable. In Great Britain the remains of this period, mostly of a marine character, are abundant, and among them specimens of the indubitable handiwork of man have been obtained from many cave-dwellings, such as that of Kent's Hole, Torquay. The human remains of this period everywhere are chiefly weapons or implements made of chipped, not ground or polished, flint or chert, the characteristic tokens of Palæolithic Man. The articles so formed consist of arrow-heads, cutting instruments, harpoon heads barbed on one or both sides,

awls, pins, and even needles with well-formed eyes. In many places also fragments of bone and other material are found engraved with firmly outlined and thoroughly characteristic drawings (mostly, however, from continental caves) of the reindeer, the cave bear, the great Irish elk, and other animals with which they lived. There is no evidence, however, of his having been able to work



ANCIENT STONE IMPLEMENT FOUND AT CANTERBURY.

metals, to make boats, or to practise any of the simpler handicrafts.

Whence or how Palæolithic man entered England can only be conjectured. In his case, as in the case of all other settlers in this extremity of the Old World, we may fairly presume that England was one of the last regions into which inhabitants would be pushed by pressure from behind. If the British Isles were then as

they are now, we must necessarily assume that they entered by sea, notwithstanding the want of evidence of their having been acquainted with boats. But we are not obliged to make any such assumption. Hand in hand with the advance and retreat of the former ice-sheets there went on changes in the relative position of land and sea; and it is almost certain that during a part of the interglacial period in which man is first met with, the British Isles were not merely connected with the mainland by a narrow isthmus, but formed part of a continent extending to the margin of that platform on which these islands with the shallow surrounding seas alike rest, and the edge of which dips suddenly down to the true ocean bed, at the distance of 20 to 200 miles from the Irish or British shores. In these times there would be no obstacle to the advent of Palæolithic man in England, boatless though he was.

But this state of matters did not continue throughout the interglacial period to which Palæolithic man belongs. Before the arrival of the third Ice Age a subsidence took place, the British Isles got severed from the continent, and at the culmination of this stage the coasts of England were submerged to a depth of 300 to 400, those of Scotland even 500 feet. Whether Palæolithic man survived in England till the third Ice Age we cannot say. On the continent of Europe there is evidence of his having lived beyond it; but in any case there is no reason to believe that any descendants of Palæolithic man survive in England to this day.¹ In most cases where Palæolithic and Neolithic relics are both found in North-western

¹ Prof. James Geikie, *Great Ice Age*, 3rd ed. p. 628. For more recent evidence with regard to the glacial epochs in Europe see papers by the same author on "The Tundras and Steppes of Prehistoric Europe," illustrated by maps, in the *Scot. Geog. Mag.*, June and July 1898.

Europe, there is strong evidence of a break in the succession. In that region the third Ice Age comes between the two.¹

In Great Britain this third Ice Age is represented by the upper boulder clay and fluvio-glacial deposits (river sands and gravels). The ice-sheet seems then to have covered the Irish Sea and the German Ocean almost as far as the Wash, but it left Middle England free.

3. Neolithic Man

Long after it had passed away appeared Neolithic man. At the probable time of his advent the climate of Europe had become temperate, the land being clothed and peopled with the floras and faunas which at present characterise it. In many respects the New Stone Man was more accomplished than his predecessor. He did not merely chip his implements into shape, but ground and polished them. Moreover, he did not confine himself to flint and chert, which Palæolithic man employed almost exclusively, but used a variety of hard stones. Further, he had learnt those remarkable arts of spinning and weaving, the history of which, like that of many others of the most notable discoveries of man, can never be ascertained. He could also make earthenware, but not with the potter's wheel, and though his implements were mainly of stone he was not ignorant of mining. Of coins used by him there is no trace. If it was necessary to cross a

¹ On the mainland of Europe it is otherwise. A remarkable section, containing among other things relics of a lost race of Neolithic pygmies, which has been opened up at Schweizersbild, near Schaffhausen, makes it appear possible that Neolithic man had already arrived in that district before Palæolithic man had disappeared from Switzerland. See a paper by Prof. James Geikie in *Scot. Geog. Mag.*, September 1897.

strait when he entered England the want of boats would not keep him out, for he could build boats that would carry him to Ireland or to France. But the probability is that there was no such necessity. England was again joined to the continent about the beginning of the period when he is first met with, though subsequently during the course of the same period the severance took place which has continued ever since, and before the close of the period the present coast-line of Scotland was under water in places to a depth of 50 feet.

It has been said above that Neolithic man was not ignorant of mining. That means that the later generations of the Neolithic period had become acquainted with the use of metals. Between them and their successors in evolution there is not that great gulf fixed which exists between them and their predecessors. Or rather, to speak more accurately, the remains that have come down to us enable us to follow the transition in the second case though not in the first.

4. The Men of the Bronze Age

In the use of metals two periods are usually distinguished—the Bronze and the Iron; and this distinction is admitted to hold good at least for the northern countries of Europe, including Britain. In the region round the Mediterranean the remains of bronze and iron are so mingled together that the distinction between these two eras is not so easy to establish. It is with Britain only, however, that we are at present concerned, and there seems to be no doubt that in that island the Bronze Age preceded that of iron; but in saying this all that is necessarily implied is that a period in which bronze remains are more numerous than that of iron

came before that in which iron remains predominate, or iron is known to have been extensively worked.¹ This period is vaguely referred to about 3000 to 2000 B.C., and the fact that a date can be assigned to it, however vaguely, gives special interest to several of the points to be noted about the Bronze Period in Britain.

In the first place it should be noted that the remains that have been preserved afford evidence of advance between the beginning and the end of the period. At the beginning of the period the only articles of bronze in use are the axe, the knife-dagger, and the awl. At the end of it, though flint-tipped arrows are still in use, the workers in bronze had acquired consummate skill in casting and hammering out that material, and produced spear-heads and wrought shields that could not be surpassed at the present day. Great skill had also been acquired in the working and carving of wood and horn, and in the inlaying of wood and amber with minute gold pins.

Secondly, we have to note that there is evidence of some cereals having been cultivated, for bronze sickles have come down to us.

Thirdly, it should be noted, on the other hand, how

¹ It is not a necessary conclusion that the bronze remains of the Bronze Age were largely made in the countries where they are now found before iron was worked at all or worked to any great extent. The rarity of iron remains from early times in the North is ascribed by some to the moist and frosty climate, which is inimical to their preservation. The bronze articles, on the other hand, are not improbably of foreign manufacture. In Britain they are found chiefly in the South, which, there is good reason to believe, was visited by Phœnician and other traders in very early times. In the North early iron remains are relatively more numerous. The bronze articles found in northern countries are principally fancy and decorative articles, such as might be expected to form articles of trade (See Ludwig Beck, *Geschichte des Eisens*, especially pp. 599-601, 679-681).

slow in some things is the progress made, for the potter's wheel is still apparently unknown in Britain. Pottery is found in various forms, but none made with the wheel.

Fourthly, there are several indications of the fact that even then Britain paid the penalty of its position on the outside of the known world, away from the centre in which most improvements arose, and accordingly behind the mainland of Europe. The remains of the period in Britain are more scanty than those of some parts of the continent. The ornaments found in Britain are in less profusion than those in Switzerland, for example. On the continent the lathe was used, but the vessels of amber and shale turned in the lathe which have been found in Britain are conjectured to have been imported from abroad.

Fifthly, it is to be noted that apart from the conjecture mentioned in the last sentence there is sufficient evidence to make it probable that commerce was already carried on with the mainland. Even if we may suppose that the amber vessels found in Britain may have been made there, the material was probably imported; so too probably were the glass and ivory ornaments which have been found.

There is no reason for doubting that among the inhabitants of Britain at this day there are direct descendants of the men of the Neolithic and Bronze Periods. That there are any pure descendants of the people of those times is not to be supposed, seeing that there is little ground for believing in the purity of descent of the people of any race. But along with other blood that mingles in the veins of the English of the present day, there may well be some that began to flow in the veins of Neolithic progenitors.

5. The Celts

But the earliest inhabitants of Britain that survive in their language are people of Celtic speech. Much remains to be settled, if it ever can be settled, as to the origin of the different communities still speaking Celtic languages or who spoke such within historical times. With regard to the Picts, who no longer survive by name, it seems now to be universally admitted that they were of Celtic speech, in spite of the cogent argument with which *The Antiquary* has made us familiar. Mr. Keane adds: "There is no longer much doubt as to the identity of these Picts with the continental Pictones, Pictavi, whose name survives in *Poitou*, and its chief town *Poitiers*."¹ But with which of the other Celts of the British Isles they were most nearly akin in speech still remains undecided; and it is best for us to confine ourselves to the undisputed statements, that the people who call themselves the Cymry,² and whose language is still spoken in Wales and was spoken in Cornwall down to the eighteenth century, are the representatives of the ancient Celts of Southern Britain; that their language differs from that of the Celts of Ireland, who call themselves Góidil, Gaoidhil, or Gaels, and whose language is closely allied to that still spoken in parts of the Scottish Highlands. The Belgæ, whom Cæsar mentioned as occupying Britain south of the Thames in his time, and are taken by Dr. Guest to have been Gaels, but by others to have been originally of Teutonic speech, are generally believed, whatever their origin, to have already been Celtic in speech long before the time of Cæsar.³

¹ *Man: Past and Present*, p. 525.

² C pronounced K, first *y* like *u* in *but*, second like *u* or *y* in *busy*.

³ Keane, *Man: Past and Present*, p. 528.

6. Earliest Historical References to Trade with Britain

It was thus entirely with people of Celtic speech that Britain was peopled at the time of the earliest historical references to the island. So much we may regard as certain, even though it is not certain what the earliest historical allusions are. Herodotus speaks of tin and amber as being both derived from the extremity of Europe. In the same passage he tells us that tin came from the Kassiterides,¹ but adds that he does not know where these islands are. They have been generally identified with the Scilly Isles, but it has been proved almost to demonstration that this identification is wrong.² They are now placed off the coast of Galicia in Spain, a district noted for its tin for more than fifteen hundred years after the time of Herodotus, and where, it is said, children still pick up tin in the basin of the Douro. Nevertheless some of the tin, which was certainly an article of trade with the Phœnicians at an early date, may have been derived by them directly from Britain, and probably was so, for stones with Phœnician inscriptions are found in Cornwall, and there are other signs of the presence of that people in the British Isles elsewhere. The first allusion that may be referred almost with certainty to Britain belongs to the fifth century B.C., being found in Hecataeus, who speaks of a round temple of the sun on the island possessing a mild climate in the ocean opposite Gaul, a "temple" that may be confidently identified with Stonehenge. It is highly probable that Hecataeus learnt about this island from Phœnician traders, but there is no evidence that either the Phœnicians themselves or their colonies of

¹ iii. 15.

² See Götz, *Die Verkehrswege im Dienste des Welthandels*, pp. 267-269.



STONEHENGE.

Carthage and Gades made regular voyages to the island. Had they done so, Götz argues with much force,¹ the voyage of Pytheas into northern waters about 330 B.C. would not have excited so much astonishment as it did. Neither is there any evidence to show that the expedition that sailed from Carthage for the north-west, under Himilco, about the middle of the fifth century B.C., visited Britain, and the Pytheas just mentioned is the first explorer whom we have good reason for regarding as having visited these shores. Pytheas sailed from Marseilles, and one of the aims of his expedition appears to have been the discovery of a direct route to the land producing tin; but whether the project was based on the report of similar voyages made by others or, like our expeditions in search of a north-west passage, on conjecture, we cannot say. Neither can we tell how far his explorations to Britain extended, for his work has not come down to us. We have only reports of what he stated. These reports, however, point to Britain clearly enough. He notes the disappearance of various grains, the use of fermented liquors made of corn and honey, the practice of threshing in large barns on account of the want of sun and the frequency of rain. He notes also, it may be mentioned, the increase of the tides with the full moon, and their decrease as the moon wanes.² Götz conjectures that from the third century B.C. onwards the Carthaginians made at least occasional direct voyages to Britain for the sake of tin.

During the same period the Greek cities in the north-east of Spain and the south of France (Emporiae, Rhoda,

¹ *Die Verkehrswege im Dienste des Welthandels*, Stuttgart, 1888, p. 270, note.**

² Bunbury, *History of Ancient Geography*, vol. i. p. 600: Sir C. Markham in *Geog. Jour.* vol. i. pp. 504-524.

Narbo, Massalia) seem to have carried on a land trade with Britain by different routes; sometimes by way of the west of France through Brittany, and thence to the Isle of Wight, and finally westwards to the tin mines; afterwards by way of the Straits of Dover. In the time of Cæsar this trade seems to have come to an end, probably owing to the greater productiveness of the Galician tin mines.¹

7. Cæsar's Account of the Inhabitants of Britain

The first detailed account we get of the Celtic inhabitants of Britain is that of Julius Cæsar. It is of all the greater value, not only from its being based on personal observation (the campaigns of 55 and 54 B.C.), but also from what we know of his habit of careful observation. An instance of his thoroughly scientific spirit, his disposition to count and to measure, has already been noticed in his determination of the length of the day in Britain by a water-clock. Cæsar's first visit in the late summer of 55 B.C. was merely a visit of inspection, and for our present purpose is of interest only from the fact that his account of it contains the first historical reference to the forest that gave name to the Weald—the forest in which the British took refuge after the battle fought near the banks of the Stour. In the following year he advanced inland and crossed the Thames by a ford. The position of this ford is only matter of conjecture. Cæsar says that it is the only one by which the river could be crossed on foot, which must mean of course that he understood it to be the lowest ford by which in his time the river could be so crossed. It

¹ See William Ridgeway, "The Greek Trade Routes to Britain," in *Folk-Lore*, March 1890.

does not follow that it was the lowest ford by which it could be crossed some hundreds of years later. Cæsar mentions that stakes were placed in the river to defend the ford, and from the remains of stakes known as Coway Stakes, near Walton-on-Thames, where, on the north bank of the river, the name Halliford still preserves the tradition of a ford, and where in Camden's time (end of sixteenth century) there was scarce 6 feet of water, Camden places the crossing-place at that place, and recent scholarship tends to support that view. It has been objected that the Coway stakes run across the river and not in such a manner as to prevent the crossing of the ford; but Dr. Guest replies¹ that that was not the purpose of the stakes, which must have been intended to confine a hostile force to a narrow and thus easily defended passage. Cæsar then advanced on the north bank of the Thames to the entrenchment of Cassivelaunus, some stronghold defended by woods and marshes, after the capture of which he returned. These details are of importance as showing how much Cæsar could learn from his own observation.

Let us now, therefore, turn to what he tells us of the Britons.

In one particular we have to note a very slow advance as compared with Neolithic times, if there is any advance at all. The inland inhabitants for the most part, he says, sow no corn, but live on milk and flesh, and for clothing wear skins. "Of all the natives," he further states, "the most civilised are the inhabitants of Cantium, all that country lying on the sea-coast, and the manners of this people are not very different from those of the Gauls." The part of Britain on the sea-coast that Cæsar actually knew was, as we have seen,

¹ *Origines Celticae*, vol. ii. pp. 384, 385.

confined to the region that still bears virtually the same name Kent; but whether we should confine this statement to that part of the country is not certain. No doubt Cæsar would make inquiries as to that part of the country which he did not visit. Even if it was his intention to confine the statement to Kent, it cannot be taken for granted that in Cæsar's time this was the only part of the country where arable agriculture was general. It is to be borne in mind that the first Roman colony was planted north of the Thames (about a hundred years later than Cæsar) at or near Colchester in Essex, and about that time, judging from the accounts given of the insurrection of Bonduca (Boadicea), we may conclude that the eastern parts generally between the Thames and the Wash were fairly populous.

Among the things mentioned by Cæsar that indicate an advance on Neolithic man, are that they made use of money (either of brass or iron rings of a certain weight) and chariots in battle. It is from Pomponius Mela, who probably lived under Claudius, that we get the particular that the axles of their chariots were armed with scythes.

Strabo, a writer of the time of Augustus and Tiberius, and who must have had opportunities of speaking to soldiers who had served under Cæsar, adds that some of the Britons are totally unacquainted with the making of cheese, though they have plenty of milk. Diodorus Siculus, another contemporary, says that their houses are for the most part mainly built of reeds or wood. Their corn, he states, they kept in the ear under cover, rubbing out as much as they want for each day's use. Columella and the elder Pliny both mention the fact that the Britons improved their land with marling—a much-needed improvement on the London Clay of Kent.

After the withdrawal of Cæsar no attempt was made by the Romans to occupy Britain till the reign of Claudius in 44 A.D. Augustus, however, received in Gaul the submission of British princes who sent deputations to him thither, and consented to pay easy duties on articles of commerce between the two countries. Among these it is interesting to find mentioned ivory, bridles, chains, and vessels of amber and glass,—no doubt, all articles of export from Gaul to Britain.¹

That tin was mined by the Britons is, of course, well known, and that they mined and smelted also iron, which they required, there is no reason to doubt. There is evidence also that the wealth of England in lead was already known and made use of. Along the line of the Mendip Hills there is a series of pre-Roman workings. As to copper (*æs*), Cæsar states that this was imported by the Britons, and possibly the term he uses may be taken to include bronze.

¹ Strabo, iv. 400 (Camden).

CHAPTER XII

ROMAN BRITAIN, 44—410 A.D.

THE Roman occupation of Britain, which began under Claudius in 44 A.D., lasted till the legions were withdrawn, owing to the pressure of enemies nearer home, about 410, a period of three and a half centuries. In that time much must, of course, have been done to change the condition both of the country and its inhabitants, but definite information on this head is disappointingly scanty. There is little but names of towns or stations for troops, remains of a few cities, and antiquities of other kinds scattered over the country, indications derived from place-names still in use, and a few historical facts, to enable us to judge of the extent and nature of the Roman occupation. There is thus much incitement to and room for conjecture.

Within thirty years after the first occupation Agricola conquered Britain as far as the Forth, and defeated the Caledonian chief Galgacus at the base of Mount Graupius. Where that mountain or hill is we cannot say. There is no reason to believe that it belonged to the range to which its name has been transferred, through a misreading of the text, in the altered form of Grampians. Agricola then erected a chain of forts between the Forth and Clyde, and this may be

looked upon as the limit of Roman conquest. The Roman occupation wavered in the north between this line and that marked by the valleys between the Solway and the mouth of the Tyne. The latter limit was fixed by Hadrian in the early part of the second century, and was again and finally adopted under Severus in the beginning of the third century.

As to the geographical extent of Roman influence south of that line, the best guide to follow is perhaps that afforded by the *Itineraries* of Antonine. This work gives a list of the military roads of the empire and the towns and military stations on their route, with their distances from one another in Roman miles.¹ Some of the places he names in Britain are clearly identified from other authorities, but for the others the only clues in many cases are what are found in these distances, together with an examination of the route, aided in some cases by the discovery of Roman remains, or by place-names still indicative of Roman occupation. In the form in which we have it, the work is believed to belong to the time of one or other of the Antonines (whence the name) in the latter part of the second century A.D. It may thus be taken as giving us the military routes and the names of the chief places in the latter part of the second century. A few other names are obtained from Ptolemy, who belonged to about the same period. Ptolemy gives us latitudes and longitudes, but as these, it need hardly be said, are not to be relied on, they also serve only as a clue, and the places have to be identified, like those of the *Itineraries*, with the aid of other researches. Some further names are derived from the *Notitia*, a work referred to about the end of the fourth century, and accordingly shortly before the

¹ A Roman mile = eleven-twelfths of an English mile (nearly).

departure of the Romans. This furnishes the names of all the stations on the wall of Hadrian, but in addition to these it does not supply many names—at least many inland names—not found in the *Itineraries*. A few additional names are found in other authorities, and some localities are known by inscriptions. The general result of an examination of all the authorities seems to be, however, that the *Itineraries* are still the best guide as to the extent of Roman influence in Britain.

Let us look, therefore, at some of the facts of which these *Itineraries* appear to afford an indication. The accompanying map shows the routes of the fifteen British Itinera, according to the determinations that now seem the most probable. It must, however, be borne in mind that this map does not profess to show all the roads of Roman Britain. Even at the time of the compilation of the *Itineraries* there were no doubt many minor roads not entered in that list, and there are certainly many other roads, some important, of later date. A few of these are referred to individually in the following paragraphs, but there are many others which can be shown to be Roman by the structure of still existing remains, or may be safely inferred to be Roman from their arrowy straightness for miles together, as well as the occurrence on their route of such names as Streatham, Stretton, etc. The occasional deviations from straightness in such roads where the same line is resumed beyond the deviations is easily accounted for in various ways. In some places the deviation occurs where the road has passed through soft ground and has consequently fallen into decay. In some cases it may have originally been laid round such soft ground. In other cases the road has manifestly been diverted in later times so as to run through a town or village of later than Roman date.

1. Roman Roads South of the Thames

Of the routes south of the Thames it will be noticed that the two leading to forts in the south-east, that to Richborough (*Rutupiæ*), Dover and Lympne (*Portus Lemannæ*), and that to Southampton (*Clausentum*) and Chichester (*Regnum*), both avoid the great forest of the Andred. The Dover Road is tolerably direct, a good enough foundation being found on the Chalk or near its margin on the Lower London Tertiaries, in the region which appears to have been the most thickly peopled at the time of Cæsar's invasion. The route to Southampton, however, involves a long detour. It keeps first north of the Thames, running nearly straight across gravel and sand¹ to Staines, just touching a northern loop of the Thames at Brentford where it forded the Brent, and then proceeding along the chord of a southern loop of the Thames to Staines. There, without crossing the Coln, it crossed the Thames at the station of Pontes, probably by a causeyed ford, the stones of which afterwards gave name to the village. Thence it passed west to Silchester (*Calleva Atrebatum*) between a forest, on the north of which Windsor Forest is the remnant, and the heaths of the Bagshot Sands on the south. At Silchester it was near the margin of the Chalk over which the roads, now west of the Andred, passed in different directions—one south-west to Winchester and Southampton and thence eastwards to Chichester, one in a more westerly direction to Old Sarum (*Sorbiadunum*), another road ganglion, and a third (not included in the Itineraries) north to the Thames at Wallingford.

Remains of a Roman road leading direct from Chichester north-eastwards through the forest of the

¹ See above, p. 116.

Andred are visible in many places, but this road seems to be unquestionably of later date than the *Itineraries*. It has been traced by Mr. Roach Smith nearly all the way from Ewell to Chichester.¹ On the London side of Ewell it has not been traced, but the remarkable Roman-like straightness of the road from Ewell to Tooting, with the exception of the rectangular deviation at Merton, may countenance the suggestion that that road is in the main on the line of this old Roman road; and this suggestion may seem to acquire further strength from the observation that the line referred to is once more continued with the same Roman-like straightness in Clapham Road and Kennington Park Road, which point directly to the south end of London Bridge. Another Roman road, of which fewer traces remained, must have led from Pevensey (*Anderida*) and entered London through Streatham.

2. Roman Roads North of the Thames

North of the Thames we have to note first that there is no direct northerly route leading out of London. Ermine or Erming Street is frequently marked as leading due north from London to Cambridge, but the fact mentioned by Dr. Guest² that on this route there are no remains of Roman stations, Roman villas, or burial-grounds, warrant the belief that in Roman times no road led this way, and it may safely be inferred that the marshes of the Lee and the forests on both sides (represented now on the left bank by the remains of Epping Forest) here formed a tract of such a nature that it was not worth while to make a road through it. The road to Lincoln accordingly proceeded first eastwards and

¹ See *Jour. Brit. Archaeol. Assoc.* vol. xxxii. pp. 481-487.

² *Origines Celticae*, vol. ii. p. 238.

then north-eastwards. Thence, in order to find a northerly route, it turned again westwards to Cambridge and Huntingdon, from which latter point it ran north to Lincoln, to a large extent along the Oolitic limestones.

The great road to the north-west—that is, to Wroxeter (*Uriconium*) and thence to Chester, one of those known as Watling Street—runs, it will be observed, to a large extent straight, but makes a bend, so that the latter part of the route is more westerly than north-westerly. It thus passed north of the forests which at one time filled the angle between the Avon and the Severn, which survived over a wide extent of country for more than a millennium after the departure of the Romans, and of which there are considerable remains here and there even at the present day.

This great north-west route was joined nearly at right angles by the great north-east route from Lincoln, known as the Fosse Way.¹ With regard to this road we have to notice that it does not cross the Trent. It appears to have touched that river at some crossing-place not far from Newark, for the name *Ad Pontem* can hardly have had any other meaning, and the distance given in the *Itinerary* from the next stations in both directions, which are identified with a considerable amount of probability, would seem to place it at the spot mentioned. But of this station there are no remains. There is no modern place-name to indicate the former existence of a Roman station here. The station would appear to have been unimportant. There was no Roman road running north following the left bank of the Trent, which seems to have been then but thinly peopled.

¹ The point of junction, High Cross, in the middle of the south-west boundary of Leicestershire, is the highest point in the district—440 feet above sea-level.

In the *Itineraries* the Fosse Way does not appear as continued beyond (that is, to the south-west of) the great north-west road, which it joined at the middle point of what is now the south-west boundary of Leicestershire, where Camden found tradition of "a most flourishing city named Cleycester,"¹ partly on the site of the present village of Claybrooke. But there seems to be no doubt that some time within the Roman period the road was continued farther to the south-west. It thus passed first through a district that was mainly forest even in the time of Camden, and then through what in his time was known as the Feldon or more open part of Warwickshire,² and then onwards through Cirencester (*Corinium*), Bath, and Ilchester, to Exeter (*Isca Dumnoniorum*). Beyond—that is, north-west of the junction of Watling Street and the Fosse Way—there was another important meeting-place of Roman roads at *Letocetum*, now Wall, close to Lichfield, a fact which without doubt greatly contributed to the importance of Lichfield in the days of the Mercian kings. From the immediate vicinity of Wall the Ryknield Way, a Roman road, runs north-eastwards past Church Stretton towards Burton-on-Trent and Derby, and from near Lichfield another Roman road ran south-westwards towards Walsall.

Lincoln was the focus of the chief roads leading farther north, and from Lincoln the northern road of the *Itineraries* led first north-west, for the same reason as the north-westerly road from Colchester to Cambridge—to avoid forests, or

¹ *Britannia*, vol. ii. p. 193 (Gough's ed. 1789).

² "The county of Warwick . . . is divided into two parts, *Feldon* and *Woodland*, or the Feild and Woody country, parted from each other by the river Avon running obliquely through the middle of the county. . . . The *Feldon* lies on this side the Avon, being a champaign country, diversified with corn and grass, and yielding a most delightful view from the hill called *Edge Hill*" (*Britannia* (Gough's ed.), vol. ii. p. 327).



Frith, photo.

LINCOLN.

both forests and marshes, on the south and an extensive fen country on the north, for till long after Roman times the Trent and the Don, like the rivers of the Wash basin, glided or oozed through fens in their lower course. Passing round these fens, the road crossed the Don, Aire, and Wharfe by the lowest fords at Doncaster (*Danum*), Castleford (*Legeolium*), and Tadcaster (*Calcaria*) respectively, and thus reached York (*Eburacum*). The straight road leading due north from Lincoln to the Humber at Winteringham is undoubtedly, however, also Roman, and in Roman days, as now, communicated by ferry with another road leading to York by way of Market Weighton. From very early times York was an important Roman city, situated, like the modern city, on both banks of the Ouse on boulder clay resting upon Keuper Marl. The river here is only from 60 to 90 yards wide, and must from a very early date have been crossed by a bridge; but without crossing the Ouse, one could continue northwards on the right bank of that river to Aldborough (*Isurium*), where the river was shallow enough to be forded, and whence the road continued northwards between the Ure and the Swale, till the latter river was crossed at Catterick Bridge (*Cataractonium*), near Richmond. Going southwards from Aldborough, the *Itineraries* give no more direct route than that by York, but in later times at least another road seems to have led nearly direct south to the ford near Tadcaster, and thence onwards. Remains of a road, probably Roman, leading in that direction were found near Aldborough early in the eighteenth century.¹

We must notice further that the road leading north from Aldborough was the main road to the north for both ends of the wall. The road to the north-west

¹ See Gough's ed. of Camden's *Britannia*, vol. iii. p. 60.

(Carlisle) diverged from that to the north-east (Newcastle and Wallsend) at Catterick Bridge, and passing thence north-westwards to Bowes, crossed over Bowes Moor and Stainmore Common into the valley of the Eden. It is this route that is given as the route from London to Carlisle (Iter V.), and also as that (in the opposite direction) from the western extremity of the wall to Richborough on the Kentish coast (Iter II.), though this latter takes us by Chester and Wroxeter, and thence along Watling Street, getting to Chester from York by way of Huddersfield (or some place near it) and Manchester. This seems to afford a pretty clear indication of the relative unimportance of that part of England which lies between the Mersey and the valley of the Eden in Roman times, though it is true that another road (Iter X.) is given as leading from the valley of the Eden more directly southwards, passing Ribchester and Manchester, the former of which, if we may judge by the remains found, was by much the more important station. This Iter is, however, an obscure one; the text is faulty, but whatever be the true readings and the right identifications, there seem to have been long intervals between several of the stations, which also tends to confirm the inference as to the relative insignificance of this part of the country.

To the west of England a Roman road seems to have led, at some later time than that to which the *Itineraries* belong, from some point on Watling Street, along the base of the Chiltern Hills, to the Thames at Dorchester. This is a place not mentioned in any ancient text, but shown to be Roman both by the name and by the remains found here. It probably stood at a Roman crossing of the Thames, for Roman remains have been found also at Sinodun Hill opposite. Here the road

would enter the valley of the Ock, and proceeding westwards, it crossed that river a little to the south of Stanford, and farther west would branch, proceeding to Bath on the one hand, and to Cirencester and Gloucester on the other.

West of the Severn, which was crossed at Gloucester, the road passed through the north of the Forest of Dean to Ross, and thence to Usk. Here it crossed another road, on which were important stations on heights at Caerleon and Caergwent, and others on the fords of the Neath and Llwchwr (Loughor), and terminated at Carmarthen (*Maridunum*), and north of Usk passed along the east of the Welsh hills by Abergavenny, Kenchester, and Leintwardine to Wroxeter.

Now it may be noted that on all the roads just considered only crossing-places are mentioned in the three great valleys of the Thames, the Severn, and the Trent, including the two seaports of London and Gloucester. There are no signs of these rivers having been in Roman times important waterways. Beyond what have been already stated, there are very few signs of Roman settlement in these valleys. There is indeed one other town, now important, on the Severn with a name indicative of Roman origin, namely Worcester, and an old parchment mentioned by Camden says that it once boasted of a Roman wall. It may perhaps have been founded in late Roman times, and hence perhaps soon abandoned. On the Trent there is no town, village, or hamlet with a name suggestive of Roman origin, unless we count Stretton, not far from Burton-on-Trent, and close to the mouth of the Dove, the river whose valley contains Uttoxeter and Rocester. It would appear to be probable that in Roman times all these great English valleys were rendered uninhabitable in most places by reason of woods

and marshes. The prevalence of such features in Britain is constantly alluded to by Roman writers. We may take it as probable that in the period when Roman power was at its highest the *Itineraries* of Antonine marked out the lines in which the comparative absence of these features left most room for cultivation and population.

3. Condition of Britain in Roman Times

We may conclude that the population that could then be maintained in Britain was comparatively small, and that the civilising influence of Rome, though in a measure extended over the whole length from the English Channel to the wall, and at times even beyond that, and from the east to the west coasts, yet did not reach over a wide area measured from the lines of the chief roads. That influence would of course be most directly felt in the Roman towns and stations. Tacitus, speaking of a time only about thirty years or so subsequent to the first occupation of Britain, refers to the readiness with which the wealthier natives of the island acquired a taste for the Roman dress, porticoes, and baths and splendid tables.¹

There are various indications that the opportunity for exploiting mineral wealth was probably the chief attraction for the Roman in Britain, just as it was for the British in Rhodesia, and the pursuit of this kind of industry, though it may involve the exercise of extensive rights of government, does not necessarily lead to wide-spread settlement. One of the most significant indications of this kind is the fact that a plate of lead with a Latin inscription has been found in the neighbourhood of the

¹ *Agricola*, c. 18.

lead mines of the Mendip Hills bearing a date as early as the sixth year after the beginning of the Roman occupation under Claudius. It has already been mentioned that those mines were worked even in pre-Roman times. No doubt the Romans had heard of them and immediately after the occupation began to work them for their own advantage. Not very long after Pliny informs us that the British output of lead was so great that it had to be restricted by law.¹ Roman remains would seem to show that lead was mined under their rule in almost every part of England where it has been mined since. In Pearson's map of Roman Britain six secondary roads are represented as radiating from a point in Derbyshire almost on the site of Wirksworth, at all times one of the principal lead-mining centres in England. If this is correct we can hardly be wrong in taking it as evidence of the importance of those mines during the Roman period. If one may accept Mr. Thompson Watkin's interpretation of the Iter X. of Antonine's *Itineraries*,² then one portion of that road led north-east from the Eden valley along what was afterwards known as the Maiden Way (see Scott's *Guy Mannering*, ch. xxiii.), and terminated at Whitley Castle, which Mr. Watkins identifies with *Glanoventa*. In that case this station must have been only a mile or two to the north of Alston, an important lead-mining town in Cumberland, which may be conjectured to have been a Roman lead-mining centre under the protection of that station. Camden mentions traces of a Roman garrison at Baintbridge, close to Askrigg, in Wensleydale, Yorkshire, and this was in all probability for the protection of the lead mines worked in Roman times in that valley as they are still. A pig

¹ Garnier, *History of the English Landed Interest*, Modern Period, p. 17.

² See *Archæol. Jour.* vol. xxviii.

of lead with a Latin inscription found in 1890 at South Cave, close by the Humber¹ ferry above referred to (p. 224), was, no doubt, brought down from this district for export.

There is abundant evidence of the Romans having worked the iron ores both of the Weald and of the Forest of Dean. Traces of their workings are specially abundant in the latter district, which is said to have supplied the material used in an important armoury carried on by the Romans at Bath.² Signs of Roman copper workings have been discovered near Amlwch in Anglesey, and gold was obtained in other parts of Wales. That Cornish tin was also worked, is proved by the fact of blocks of tin with Roman inscriptions having been found in Cornish mines and stream works; and coals were found in such a situation in a chamber in the Roman wall in the Tyne valley as to make it quite clear that the coals must have remained there from Roman times, proving that the coalfield of that valley was already opened.

That the salt-pits both of Cheshire and Worcestershire were worked by the Romans is clearly enough indicated by the Roman roads in both districts. In the case of Cheshire this evidence is pointed out by Camden, who states that he had no doubt that the Romans were acquainted with these pits, "for from Middlewich to Norwich [Northwich] runs a noble road raised with gravel to such an height as easily to be known for a Roman work." In Worcestershire again a Roman road survives, leading from about Birmingham southwestwards through Bromsgrove and close by Droitwich to Worcester.

¹ See *Archæol. Jour.* vol. xlvii. p. 257.

² See Beck, *Geschichte des Eisens*, pp. 674, 675. Beck appears to have drawn his information from Scrivenor, *History of the Iron Trade*, p. 6; but I have been unable to ascertain the original source of the information.

By this road Droitwich salt was probably brought down to the Severn, while eastwards from Droitwich runs another road, evidently Roman, and still apparently known as the Salt Way, leading past Feckenham to the midlands.

But even if mineral exploitation was the main reason for the presence of the Romans in Britain, that was not the only effect they had on industry. Roman potteries existed in several places. Winchester in Roman times was noted for its embroideries, and other manufactures were carried on.

The Romans also introduced new objects of cultivation, and directly and indirectly stimulated the development of agriculture. The attempts to grow the olive and the introduction of the vine have already been referred to (p. 178). Whether through the employment of British slave labour by Roman settlers or in consequence of the demand created by the requirements of the Roman settlers and soldiers and Romanised Britains, the production of corn in Britain was greatly increased, so that in later Roman times Britain, which, according to Cæsar, grew little corn except apparently in Kent, was regarded as one of the granaries of the west. In the year 358, after a great defeat of the Germans by the Romans and the compulsory restoration of prisoners taken by the former from forty Roman cities, 800 considerable vessels (*πλοῖα μείζονα*) were sent repeatedly to Britain for corn, to supply their wants for food and seed.¹ No doubt this corn was obtained from the eastern counties between the Wash and the Thames, as well as from the vale of York, the districts in which the Romans had their principal settlements, and which have always been the principal corn-growing regions of England.

¹ Zosimos, bk. iii. ch. v.



CHAPTER XIII

THE TEUTONIC SETTLEMENTS IN BRITAIN

1. The Withdrawal of the Romans and Barbarian Irruptions in the North

THE Roman troops were withdrawn from Britain in 410, in order to defend the central parts of the empire against Goths and other barbarians. It has been agreed that after this withdrawal the Britons did not cease to regard themselves as belonging to the Roman empire, and there is nothing in fact to prove that they did. No doubt many of the inhabitants would still look upon themselves as Romans. They would proudly hand on the tradition that they were descendants of men who had already borne the name of Roman citizens when they settled in the island. They would not anticipate that Roman troops withdrawn to face an enemy in the heart of the empire would be unable to cope with that enemy. The Romanised Britons would naturally enough take the same view and look forward to the time when, the danger over, the troops would return. From such Romans and Romanised Britons, it is reasonable to suppose the governors who were chosen to administer and defend the province would be drawn, and so this view of Britain might well be at least the official view.

But whatever the contemporary views of the situation

may have been, events soon showed that from that date the destiny of Britain was changed. The northern barbarians whose irruptions the wall of Hadrian was designed to prevent, took advantage of the withdrawal of its defenders, and broke through this barrier. And here it may be worth while to draw attention to an interesting geographical fact that is expressly emphasised by Camden.¹ The wall referred to is laid along a line behind which there are two rivers, the Irthing in the west and the Tyne in the east, which might have served as a second line of defence throughout its length, except for a short interval of less than two miles between the headstream of the Irthing, on the frontier of the present Cumberland and Northumberland, and one of the headstreams of the South Tyne, the Tippall or Tipalt. But it was just at this interval that the invading Picts and Scots broke through the wall, from which fact, says Fordun, the adjoining castle got the name of Thirlwall, or the castle of the pierced wall. Thus, the wall once passed, the valleys of the Tyne and the Irthing, with that of the Eden, lay open before the invaders, who could then follow the Roman roads leading south, either directly through the present Durham or over Stainmore Common and Bowes Moor. Whatever route they may have followed they came in such numbers that the Britons of the Roman province were unable to withstand them, and sought aid from a nation of pirates whose fierce and warlike qualities they had long known.

2. The Saxons

The homes of these pirates were on the southern and eastern shores of the North Sea, from the Rhine east-

¹ *Britannia*, vol. iii. p. 232 (Gough's ed. 1789).

wards. Already before the close of the third century, their descents on Roman Britain had been so frequent and so harassing, that Maximian, the vigorous and capable colleague of Diocletian, perceived that the dominion of the sea was necessary for the defence of that island, and accordingly caused a powerful fleet to be constructed. The command of this fleet was entrusted to Carausius, an officer of approved capacity, but of too much boldness and too little honour. Having cleared the seas of pirates, he relied on the command of the sea to maintain the independence of Britain, and assuming the title of Augustus, made good that independence till his death seven years later (293). From his less competent successor Allectus, however, this independence was speedily wrested. Other fleets were got ready in Boulogne and at the mouth of the Seine by Constantius Chlorus, the Cæsar who acted under the emperor Maximian, and one of these, under cover of a thick fog, transported imperial troops in safety to Britain, "convincing the Britons," remarks Gibbon, "that a superiority of naval strength will not always protect their country from a foreign invasion." In the battle that followed, Allectus was defeated and slain, and the Britons gladly welcomed Constantius. The Saxons and their kindred, however, were still to be dreaded, and to the end of the Roman occupation the creeks and landing-places of the eastern and southern coasts of Britain, from the Wash to Southampton Water, were defended by forts placed under an officer known as the Count of the Saxon shore.

3. Settlement of Jutes and Saxons in the South

It was not exactly with Saxons, but with men of kindred speech and kindred temper, Jutes from Jutland,

that the Britons of the Roman province entered into a compact with a view to procuring their aid against the hordes of savage Picts and Scots by whom the province was laid waste. In this, we are told by the stoutest advocate of Rome in Britain, there was nothing unusual. The Romans themselves had long been in the habit of engaging barbarians as mercenaries. The Romanised Britons in this case did the same. That may be so, but, if it could not be perceived then, it is manifest now that the circumstances made this proceeding dangerous. All that concerns us, however, is the result, and broadly stated the result is, that a struggle ensued between Britons and Teutons in which Roman civilisation was almost entirely¹ swept away, that there elapsed a period of more than six centuries, a period longer than that between Edward I. and the present day, of which we have little record but one of battles between Jutes, Saxons, or Angles and Britons, Saxons and Jutes, Saxons and Angles, or all these against Danes or Norwegians, a period in which none of the conflicting powers obtained lasting rule over any wide area, and in which the advances in civilisation were slow, or, if here and there more rapid, uncertain and transient, but at the end of which we find the present England as well as parts of the present Scotland mainly in the hands of people speaking one language of Low German stock.

A few of the circumstances attending this change must engage our attention, even though only for a short space.

In the first place, the long period of 600 years may be divided into one of 350 years, comprising the invasions, settlements, and struggles of the Jutes, Saxons, and Angles, and one of about 250 years, embracing the invasions and settlements of Norwegians and Danes.

¹ See below, pp. 248-259.

With respect to the first of these periods, the most remarkable facts to notice are the slow steps by which the advances of the Teutonic invaders were made, and the mode in which the settlements made by different bands, starting from different centres, were confined by the natural features of the country at the time.

The compact with the Jutes under Hengest and Horsa appears to have been made in the year 449. The quarrel between the Britons and their allies was not long in breaking out, but it was not till the fall of Lymne in 473 that the Jutes were completely established in the habitable part of Kent, that is to say, in the comparatively narrow, somewhat wedge-shaped strip between the great forest of the Weald on the south, and the marshes of the Thames on the north.

So far as is definitely known, the next body of invaders after the Jutes was a body of Saxons, who attacked and settled the narrow strip of coast on the English Channel to the south of the forest of the Weald, and who became known as the South Saxons or people of Sussex. Their settlements, so far as recorded in history, took place from 477 to 490 or 491, the last recorded event of this episode being the destruction of the fortress of *Anderida* (probably Pevensey) and the slaughter of all its inhabitants. No advance seems to have been made up the Roman roads leading from Pevensey and Chichester to London, which would have led the invaders right through the Weald.

A more prolonged series of conquests started from Southampton Water. The first landing seems to have been effected, and the first battle fought in 495 on the east side of this channel between the mouth of the Hamble and that of the Itchen. Within twenty years Winchester was taken, and thus the invaders (Saxons,

along with a few Jutes) found themselves established on a comparatively open Chalk country, affording much more room for expansion than either of the settlements north and south of the Weald. Here they occupied a point of convergence of Roman roads, and a few years later they would seem to have followed that leading westwards to the north of the forest, the relics of which now form the New Forest, probably with the view of attacking Old Sarum, the Roman *Sorbiodunum*. This strongly situated hill-fort may have proved too strong for them, and caused them to diverge southwards. At any rate the battle which was fought took place at Charford¹ (519)—that is, at a ford on the Avon to the south of Old Sarum, where that river enters Hampshire. Being victors here, they still went on southwards, but in the following year suffered a defeat at another British fort, Mount Badon, which is most probably identified with Badbury Rings, which overlook the Allen, a tributary of the Dorsetshire Stour. This defeat put an end for the time to all westward advance, but nothing seems to have checked their progress within the bounds of Hampshire, and in the course of the next thirty years they may perhaps have spread over the whole of that country. The *Chronicles*, which record in this period only battles, say nothing of any further landings of Saxons in Southampton Water; but nothing is more likely than that, as long as there was plenty of room in the neighbourhood, the original settlers, feeling themselves not strong enough for further advance, would welcome successive bands of their kinsmen. However that may have been, there was more than thirty years of pause in the hostile progress of the West Saxons; but in 552, rather more than a hundred years after the first landing of the Jutes, they

¹ A place close to Charford is still called the Bloody Marshes.

captured Old Sarum, and thus got command of the rich Wiltshire valleys, the Wiley, the Nadder, and the Avon, and a few years later a series of successful expeditions extended their power along the districts commanded by the chief Roman roads leading out of Silchester. Eastwards they marched along the road to the north of Bagshot Heath, but they do not seem to have made for the crossing at Staines on the road to London. That crossing may have been too difficult of attack, and too well defended. At any rate they confined themselves on this occasion to the south of the Thames, and the first encounter took place (568) at or near the present Wimbledon. Here they were met not by Britons, but by Jutes, the first instance of the Teutonic settlers coming into conflict with one another, and being victorious over these would no doubt soon find their way to Croydon, and begin to settle or occupy the villages which stretch in a line along the base of the Chalk from thence to Guildford (see above, p. 104).

Three years later, having crossed the Thames by one of its upper fords, about Wallingford or Dorchester (Shillingford), and probably following the Roman road northwards to Bicester, they turned thence north-east along the road leading to and crossing Watling Street at Fenny Stratford. At Bedford they gained a victory over the Britons, which placed in their hands the four towns of Lenborough (now represented by Buckingham), Aylesbury, Bensington, and Eynsham. They thus, in fact, secured all the fertile land lying to the north-west of the Chiltern Hills.

The next expedition must have proceeded along the road to Cirencester and Bath, and a victory gained (577) at Deorham, a few miles north of Bath, led to the fall of Cirencester, Bath, and Gloucester, and to the separa-

tion of the Britons of Wales from those of the south-western peninsula of England.

This was for the time the last of the successful expeditions of the West Saxons. In another, which followed a few years later, they attacked and utterly destroyed Wroxeter (583), but were totally defeated in 585 at Faddiley when advancing farther north, no doubt upon Chester, and they seem to have retreated without effecting any new settlements in consequence of this expedition.

4. Settlement of Angles in the East and Midlands

Meantime other bands of invaders, composed of Angles, or more properly Engle, had been making settlements in the north, east, and midlands by the estuaries of the Forth and Humber, as well as by the Wash and the rivers to the south. It is needless for our present purposes to attempt to follow all these conquests, but a few facts must be noticed. In the latter half of the sixth century, or about one hundred years after the first landing of the Jutes, the whole of the eastern half of the country from the Forth to the Bedfordshire Ouse and the Suffolk Stour seems to have been in the hands of these tribes, but not under one rule. North of the Humber there were at first two kingdoms—Deira, extending as far as the Tees, and Bernicia, thence to the Forth, but in 588 these were united under the name of Northumbria. The region south of the Humber and west of the Fen country formed another kingdom, and as this was the kingdom which came most directly in contact over a long frontier with the still independent Britons, from whom the more northerly parts were separated by the scarcely inhabited tracts of the Pennine

Chain, the Cheviots, and the southern uplands of the present Scotland, it acquired the name of Mercia or the kingdom of the Marches. East of the Fen country was East Anglia, inhabited by the North Folk and the South Folk.

Of these Anglian kingdoms that of Northumbria was for a long time by far the most important. In the first century after its formation it took an important part in adding to the Teutonic sway in Britain. Its first great success was the capture of Chester in 613, an important step, inasmuch as it cut off the Britons of Strathclyde, that is the region north of the Mersey, from those of middle England and Wales. But this success was followed by a reverse in a war which is worthy of note for several reasons. In penetrating to Chester the King of Northumbria was probably regarded by the King of Mercia as having encroached on his territory. This was one reason for hostility between these two kingdoms. A few years later another was formed by Penda, King of the Mercians, in the introduction into Northumbria of Christianity, which had lately been rapidly spreading in the eastern kingdoms.

5. Introduction of Christianity. Mutual Struggle of Angles and Saxons

The introduction of Christianity among the Teutonic settlers in Britain took place first in Kent. Though the Jutish kingdom had been checked by Wessex in the advance westwards, the Jutes themselves no doubt were steadily advancing within their domain. At the close of the sixth century considerably more than 100 years had elapsed since their final establishment there. This period seems to have been one of almost unbroken peace,

and no doubt was one of steady progress, which may have been stimulated by intercourse with the continent even though there is no record of that. About 589 King Ethelbert of Kent married Bertha, the daughter of the Christian king of the Franks, and she was accompanied to Kent by a bishop, who was allowed to set up Christian worship in a ruined Christian church in Canterbury. In 597 Augustine and his companions came direct from Rome as missionaries to Britain, and soon after the King of Kent and his people adopted Christianity.

By another marriage Christianity was carried from Kent into Northumbria, for Edwin, the powerful ruler who had firmly established his power over all the seas between the Humber and the Forth, and extended its limits to Chester in the west, married a daughter of the King of Kent, through whose influence Edwin and his people were speedily gained over to the new faith (627).

Penda, however, was a determined foe of this change of religion, and soon after entered into an alliance with Cadwallon, King of Strathclyde, the British kingdom stretching from the Mersey to the Clyde. The alliance was a remarkable one, as one between Angles and Britons against Angles. Probably, however, it was an alliance of pagans with pagans, for though Christianity had been introduced into Briton under the Romans, there is no reason to believe that the Britons were thoroughly Christianised. Besides giving to Penda an important accession of strength this alliance would open for him the Roman road from Manchester across the Pennine Chain, and we may surmise that he took that road from the fact in the course of this expedition he destroyed the Northumbrian fortress of Almondbury (near Huddersfield), which had taken the place of the neighbouring Roman station of Cambodunum. The allies pushed on to

Hatfield, 7 miles north-east of Doncaster, and inflicted on the Northumbrians a crushing defeat in which King Edwin was slain (633). They then parted, Penda proceeding south to gain a hold on East Anglia, and Cadwallon advancing north. His success, however, was short-lived, he being defeated and slain two years later by Oswald, the son of Edwin, in a battle fought near the



ST. PAUL'S CHURCH, EAST JARROW.

Poulton, photo.

Roman Wall. About 660 Strathclyde was in turn invaded by the Northumbrians, who succeeded in conquering it, and further conquests were made by them in North Britain. These, however, were checked in 685 (nearly 100 years after the formation of Northumbria) by the great defeat of Egfrith by the Picts at Nectansmere or Dun Nechtan (now Dunnichen, near Forfar). Even after that, however, Northumbria continued to flourish

more or less. It was after this defeat that Northumbrian learning, which had already risen into note at Wearmouth under Benedict Biscop, rose to its greatest height under Bede (died 735) at Jarrow. But no further conquests from the Britons were made by this kingdom.

Such conquests were reserved for Wessex and Mercia, the only two kingdoms that had still room to expand. After the overthrow at Faddiley in 585 the kingdom of Wessex remained within the limits then fixed for nearly three quarters of a century. During that interval it also had accepted Christianity. Northern and eastern Somerset was conquered in 655-58, a conquest which would lay open to them much fertile land belonging to the Middle and Upper Lias Clays on both sides of the Fosse Way (see above, pp. 142, 143). In those days this district was probably largely forest-clad. East Somerset was to a large extent covered by the Forest of Selwood, which even in the sixteenth century had a circuit of 30 miles, and stretched from Glastonbury to Warminster in Wiltshire. The partial clearing and settlement of this forest would allow of an expansion of the population for some time after. There was at any rate another pause in the advance of the West Saxons, and it was only in 710 that the fertile district of the Triassic deposits round Taunton was added to their dominion. It was more than 100 years later that their conquest of the Britons was completed by the subjugation of Cornwall (815), and in the south-west the fact of the long continuance of the British language and the survival to this day of Celtic place-names for most of the villages shows that here there was less of a settlement than a mere subjection to rule.

Mercia meanwhile had also become Christianised. Even before the death of Penda Christianity had made

some way in the kingdom, with his scornful sanction, though not with his countenance, and after his overthrow and death in 655 at Winwaed, near Leeds, in conflict with the Northumbrians, no further resistance was offered to its progress. The victory just named placed Mercia for a time under the supremacy of Northumbria, but it did not finally stop its progress. The power of the kingdom waxed and waned in conflict with its rivals on the north, east, and south. The kingdom also continued to expand westwards at the expense of the Britons. Part of this expansion may have been only a gradual pushing westwards in a region where there was no marked natural boundary. The first sudden advance recorded in history is that of the crossing of the Severn. In the neighbourhood of the destroyed Roman fortress of Wroxeter (Uriconium) a British stronghold had been formed on the height of Permian sandstone now crowned by the castle of Shrewsbury, round which the Severn flows on three sides—west, south, and east. The British name given to this position, Pengwyrn, meaning "height of the swamp," probably refers to another partial defence, for here the Severn sweeps round the rock and then bends away to the north-east in a course so well defined by natural banks that in former times it must have been the same as now. It must, therefore, in those times just as at present have left a deposit of alluvium on the east and north-east side. The position was thus one of great natural strength, but it was at last captured by Offa, King of the Mercians, in 779, and an Anglian village was founded on the site with a name indicating another natural feature, the name of Scrobbesbyrig (that is Shrub-bury), which has become Shrewsbury by regular linguistic modification. After this capture the dominion of Mercia was extended far to the west of the Severn, and a

rampart known as Offa's Dyke was erected as a barrier between Briton and Anglian. This rampart was placed for the most part a considerable distance to the west of the chain of Roman forts that had connected Wroxeter with the mouth of the Wye. In the south this was its terminus, but thence it maintained a nearly due northerly course to the mouth of the Dee near Holywell. From the remains that have come down to us or have been described by older writers it does not appear to have been entirely of human handiwork. Natural features, in places, rivers, and elsewhere mountains, seem to have been taken advantage of as a substitute for an artificial bulwark, but the intention appears to have been to establish a complete line of defence. The line, however, did not prove altogether effective. Nevertheless in the middle parts of its course at least it still marks approximately the boundary between Briton and Anglian, or the Celtic and Teutonic tongues.

6. The Scandinavian Invasions

By this extension of dominion the conquest of England may be said to have been completed, for Wales has always had in a large measure a separate history; but the consolidation of England was not effected without a long series of further struggles. First of all the question of supremacy among the Angles and Saxons themselves, but this was soon settled by the victory (828) of Wessex over Mercia, and the submission in the same year of Northumbria, which at this time was in a state of disorder, arising both from internal anarchy and foreign invasion.

Already had taken place the first of those Scandinavian descents which kept England, as the country may now

be called, in a more or less unsettled state, with only occasional intervals of rest, for more than two and a half centuries. The first invaders were the Vikings, that is, "the people of the bays," namely the fiords of the Norwegian coast. Before the close of the eighth century they had begun to make descents on the east, west, and south-west of the country, but chiefly in the north-east and north-west. They were mostly piratical raids made less with the view of settlement than with the object of carrying off slaves and other plunder. Extensive settlements were, however, ultimately made between the Solway and the Dee. In 866 a still more formidable invasion took place. Large hosts of Danes then began to arrive in the Humber, and in four years these hosts conquered the whole of the eastern half of England down to the Thames. Having conquered, they settled in the country in large numbers, especially in the eastern districts between the Tees and the Wash, and in the eastern midlands between the Trent and the Nen. From these settlements they never withdrew, but the successful resistance of Alfred, King of Wessex from 871 onwards, was the chief cause that they never made any further advance. It was impossible for Alfred to drive the Danes out of England, but in the peace of Wedmore in 878 he compelled them to recognise a line running transversely through the country from the Thames to the Dee, approximately that of the Roman Watling Street, as a frontier between two powers, the Danish and the English. The former was henceforth long known as the Danelaw. Guthrum, the Danish king, was at the same time compelled to accept the Christian faith, a step which would facilitate the settling down of the Danes, who were then pagans, peacefully among the conquered English. Peace was, indeed, soon broken, but in the

next war Alfred inflicted an even more decisive defeat on the Dane, and compelled him to a peace in which the frontier was pushed farther back, and London, which had hitherto been held by the Danes, was surrendered to Alfred, who at once proceeded to rebuild its walls. A still more noteworthy fact is that Alfred recognised the necessity of a strong fleet for the defence of the English shores, and during the latter part of his reign steadily went on with its preparation. In the wars that followed under his successors, victory sometimes fell to the English and sometimes to the Danes. At times the Danelaw was compelled to acknowledge the supremacy of the English king. At other times the Danes were reinforced by new invasions, which the English were unable to repel, and finally a Danish dynasty was firmly established on the throne of England by the victory of Cnut over Edmund Ironside at Assandun (Ashingdon¹ in Essex) in 1016.

7. The Danish Kings

The reign of Cnut, which lasted for twenty-one years, is memorable for two reasons. In the first place, it is the first peaceful reign in which nearly the whole of England as we now know it was united under one rule. True, it was only part of that king's dominion, for Cnut was also King of Denmark and Scandinavia, but England was by its geographical situation a perfectly distinct member of that dominion, and the union of the crowns was only a temporary episode in the history of this country. Second, it was early in Cnut's reign that

¹ See *Proc. Roy. Geog. Soc.* 1892, p. 403, where the interesting fact is mentioned that the pronunciation Assandun was heard locally from the lips of a peasant as late as 1867.

England began to be marked off from Scotland on the east side, pretty much as the two countries have been divided since. Shortly before, the King of the Scots, that is the Celtic king of a Celtic people, had acquired a footing in and round Edinburgh, and in 1018 by a victory over English troops at Carham just south of the Tweed, his dominion was extended to that river. Northumbria was thus for ever deprived of its northern portion. It was long after this, however, that the boundary between the two kingdoms was finally settled, and the consideration of the nature of that boundary had better be left till we come to speak of the circumstances that led to the final settlement.

The slightness of the union between the crowns of England and the Scandinavian dominion was shown on the death of Cnut by the division of these dominions under his two sons. A short union took place again under one of these, Harthacnut, in 1040-42, but after his death the union was finally dissolved, and the last king of the house of Egbert of Wessex was called to the throne in the person of Edward the Confessor, brother of Edmund Ironside, and son of Ethelred and Emma of Normandy. His death in 1066 was followed by the brief reign of Harold, who was defeated and slain in the same year at the battle of Hastings, by William, Duke of Normandy, grand-nephew of the above-named Emma, who laid claim to the English crown in virtue of an alleged bequest of Edward the Confessor.

CHAPTER XIV

EFFECTS OF THE TEUTONIC SETTLEMENTS

1. **Extent of the Romano-British Survivals in Anglo-Saxon Britain**

THE brief historical sketch in the previous chapter was necessary in order that we might be in a position to form some estimate of the nature and effects of the conquests which form the subject of that chapter. There are matters which under some heads are still under discussion, and as to which only probable inferences can be made. It is the purpose of this chapter to set before the reader an account of the main facts under dispute, and the chief grounds on which probable inferences may be based.

The principal subjects of discussion may all be summed up under the general question of how far Roman influences were directly perpetuated during the Anglo-Saxon period? This general question involves many others on which different views have been and are held. To what extent was Roman Britain actually settled by Romans? To what degree were the Britons themselves Romanised? What was the immediate effect on the population of Britain of the withdrawal of the Roman troops? Did all "Romans" then retire from

Britain along with the troops? When the Angles and Saxons arrived, were all the previous inhabitants either killed or compelled to quit the districts in which they settled, or did any large number of them remain as slaves under the invaders who seized on their lands, and if the latter supposition is true, what influence may this remnant be supposed to have exercised on the new settlers?

In order to form an estimate of what are most likely to be the true answers to such questions, some further facts must be considered along with those stated in the previous chapter. Any solution of these problems must be consistent with the fact that the Anglo-Saxon conquests and settlements went on slowly, step by step, sometimes at long intervals of time, proceeding from various centres, and long confined to districts more or less isolated from one another; that the great Danish conquests were remarkably rapid, and that at the end of the long period of 600 years that elapsed between the first invasion of the Jutes and the Norman Conquest, the greater part of the present England was thickly covered with villages bearing Teutonic names, inhabited by a people speaking essentially the same Teutonic language, with very few Latin or Celtic elements, and known to the ancient British inhabitants of the island as Saxons, to the rest of the world as English.

These facts taken together seem to point unmistakably to the conclusion that the account derived from the earliest British as well as Anglo-Saxon historians of these events,—that the native British for the most part disappeared from the districts in which the invading Angles and Saxons made their settlements, is essentially correct. That language of itself is no evidence of the origin of a people is too well known to need any

emphasising, but the evidence of language acquires some strength when we know something of the circumstances under which a change of language was brought about in particular regions. Two peoples of kindred Tartar stock, the Magyars and the Bulgarians, have conquered and settled in eastern Europe within historical times. The Magyars still speak their own Tartar language, but the Bulgarians now speak Servian, and have done so since the tenth century, a period only about two or three hundred years subsequent to the conquest. The accepted inference in the one case is that the Magyars drove the previous inhabitants out of the country in which they settled, while the Bulgarians, though the conquerors, were comparatively few in numbers, and ultimately got assimilated to the subject race. On the other hand, we must bear in mind that the French, Spanish, Portuguese, and others still speak languages which they learnt from a comparatively small number of Roman conquerors. But in these cases the new language was that of a great empire, in which the countries named were wholly incorporated—a language which it was thus the interest of all the inhabitants to acquire, a language, moreover, with a rich literature in competition with one that had none, and which was thus the only medium of expression for a people raised by the conquerors to the civilisation which they themselves possessed. The circumstances in England during the Anglo-Saxon conquest were wholly different. No uniformity of rule over a wide area, no highly-organised civilisation favoured the imposition of a language from above. The new language spread with the people from various centres, and caused the extirpation of a more cultivated language, even though this latter language was favoured for the greater part of the period by the

powerful influence of the Church. We can hardly suppose in these circumstances that if a Romano-British element remained among the Anglo-Saxons, that element was very numerous or highly Romanised.

In addition to that we have to consider that when the evidence of language is reinforced by that of place-names belonging to the same language, it becomes very strong. Now this is the case in England. Not only are the great majority of place-names in England, except in Cornwall and some districts contiguous to Wales, of Teutonic origin, but they have suffered only such change of form as proceeds from direct linguistic modification. They are not mangled in the way place-names are apt to be mangled and distorted by people who speak a different language. In France, for example, it is otherwise. A large proportion of the place-names have a Celtic origin, though in form Romanised.¹

But even though it is admitted that the language of England was at the time of the Norman Conquest wholly, and that the place-names are mainly, of Teutonic origin and bespeak the presence in preponderant numbers of a Teutonic people, it is not universally agreed that that people was composed of Angles, Saxons, etc. There is at least one writer who maintains that Roman influence continued to be of importance throughout Britain even in Anglo-Saxon times, and was in a certain measure even restored to predominance after the Norman Conquest. It is an essential part of this singular theory, which Mr. Coote propounds and defends in his *Romans of Britain*, not only that the Belgæ of Cæsar were Teutons not merely in origin, but in language, and that it was their language that came to be spoken generally in Roman Britain when the Latin language completely died out,

¹ See vol. i. pp. 408-433, and especially p. 409.

and it is to them that we owe the Teutonic place-names of England. It is alike impossible and unnecessary to consider here all the difficulties that beset this view, but we may draw attention to the fact that, according to the ordinary view of English history, there is, as Mr. Freeman pointed out, a satisfactory explanation of the fact that the Teutonic settlers of England have come to be called Saxons by the descendants of the ancient Celtic Britons and English (or in one case Scotch) by the rest of the world, it is scarcely possible to offer any such explanation on the theory of Mr. Coote. The common name of the Teutons of Briton in use among the Celts was probably learnt from the West Saxons, who gradually pushed them north and west from the neighbourhood of Southampton Water, and with whom they were so long in contiguity along an extensive frontier. On the other hand, the Anglo-Saxons were for the first time clearly recognised as one people by outsiders in the wars with the Danes, whose settlements were almost exclusively among the Anglians. Hence the opposition between Dane and Anglian or Engle, Danelaw and England.

Lastly, before leaving the evidence of language attention should be drawn to the very small effect that the Danish conquests have had on the English speech. The comparatively slight difference between the language of the Danes and that of the English of that time would greatly facilitate the settlement of Danes among the English. It would tend to make intermarriage between Danes and Anglians more frequent than could have been the case between Anglians or Saxons and Roman Britons, and the effects of intermarriage, as is well known, would rapidly wipe out differences of speech, and all the more rapidly in the case in question if, as is most probable, the

husbands were mostly Danes and the wives English. Even in place-names the differences by which Scandinavian names are distinguished from English are chiefly mere differences in pronunciation, such as *-caster* for *-chester* or *-cester*, or differences of terminations, such as *-thorpe*, *-thwaite*, or *-by* for *-ham* or *-ton*. It is not to be assumed that all names that show a Scandinavian influence are wholly of Scandinavian origin. The Norwegian settlements between the Mersey and the Solway were probably made among a mainly Celtic people, although the region had previously been conquered by the Northumbrians. The rapidity of the more extensive Danish conquests in the Anglian districts, where the limits of those conquests, so far as they had a permanent influence in England, were practically determined by the campaigns of 866 to 870, makes it unlikely that the conquerors settled in the districts in greater numbers than the conquered. There is nothing in these conquests comparable to the steady but gradual advance of the Angles and Saxons against the ancient Britons. This argument must, however, be taken only for what it is worth. It is not of itself enough to prove the fact which we take it to point to, and I am not aware of any other evidence applying to the case. There are, nevertheless, three certainties to be kept in mind with respect to the Danish conquests and settlements. The first is that they did unquestionably attain such importance as to leave very extensive traces in our place-names. The second is that these traces are not found equally distributed throughout the Danelaw. On the contrary they occur thickly only in the region between the Tees and the Nen, the latter river in particular having apparently formed a sharp boundary line between Danes and Anglo-Saxons. North of that line we find the hard Danish forms *caster*, *kirk*, *cart*, *skip*, south of it

chester, church, chart, ship, the most notable example of the change being found in the adjoining villages of Castor and Chesterton near Peterborough, both probably representing the Roman station of *Durobrivæ*,¹ the northern or Northamptonshire village Danish, and the southern or Huntingdonshire village Anglian. The third fact is that these Danish settlements did not affect the unity of the language that ultimately came to be called English.

But even if we take this last fact as indicating, in the light of what has been said already, that in England as a whole the Anglo-Saxon population at the time of the Norman Conquest was predominant in numbers, it does not follow that that population contained no admixture of the earlier more or less Romanised British inhabitants. Without going as far as Mr. Coote, who would almost eliminate Anglo-Saxon influence, except as a destructive one, from English history, there are several students of the beginnings of the English people who believe that a British and even a Roman population probably continued to exist among the Anglo-Saxons in more considerable numbers, and in some respects exercised a more considerable influence than is generally supposed.²

As to the permanence of Roman influence it is argued, on the one hand, that we have no right to infer that when the Roman troops were withdrawn all Romans and descendants of Romans went with them. Many having firmly planted interests in Britain might prefer to remain there. That is undoubtedly true, and there is even positive evidence from the Anglo-Saxon period that at least Romanised Britons continued to exist in Anglo-

¹ See the article on this station by R. G. Latham in Smith's *Dictionary of Geography*.

² See C. H. Pearson, *Early and Middle Ages of England*, p. 29; Seebohm, *The English Village Community*.

Saxon England, for an urn bearing a Latin inscription has survived from that period. But the value of this observation must be estimated in the light of what has been already indicated as to the nature of the Roman occupation (p. 227). If the people who remained still continued to regard themselves as forming part of the Roman empire, the government which they established could only be an imitation of Roman administrative methods, hardly a direct continuation of the old system. We may fairly suspect that the great capitalists would take alarm and leave the island about the same time. Their trade relations with the continent, on which their mineral enterprises must have largely depended, would be endangered, if they were not already disorganised by the troubles nearer the heart of the empire.

A number of the Britons may have remained in such towns as were not at once destroyed by the invaders, but town life cannot go on independently of country life, and many of the Roman towns of Britain seem to have been abandoned during a large part of the Anglo-Saxon period.¹ There seems to be good reason for believing that even London, whose advantages for commerce with the continent were so quickly appreciated after the establishment of Roman rule, was left for a time unoccupied.² The Anglo-Saxon invaders seem to have settled down in self-contained villages, producing within their own limits nearly all they required. They had thus no use for towns either for trade or for manufacture, and where all the government on a larger scale consisted in an occasional summons to arms issued by a petty king to his retainers or subjects, such government in-

¹ Freeman, *Norman Conquest*, vol. iv. p. 220, etc.

² See Loftie, *History of London* (vol. i. p. 54), and the paper of Dr. Guest in the *Archæol. Jour.* vol. xix. which he quotes.

volved the existence of very few towns as centres of administration. The Roman roads, as has been indicated, were probably used for war purposes, but that they were not used to any great extent for trade might be reasonably inferred, it seems to me, from one fact alone, the entire disappearance without replacement at any subsequent date of the town that must have existed, and which the remains show did actually exist, at the crossing-place of two such important roads as the Fosse Way and Watling Street.

The minerals of Britain were not exploited under the Anglo-Saxons in anything like the same way as under the Romans. There are a few references in Domesday to the working of lead (chiefly in the royal demesne in Derbyshire) and others to the working of iron in various counties;¹ but nothing perhaps could be more striking as an illustration of the difference between the Roman and the Anglo-Saxon conquest than the fact that the Mendip Hills, where, as already stated, proofs have been found of the working of lead mines under the Romans within six years of the beginning of the occupation under Claudius, were not conquered by the West Saxons till more than 200 years after the formation of their first settlements by Southampton Water, and not till about 130 years after the victory which made them masters of the mouth of the Severn and the Lower Avon. The Britons, deprived of their great market, could have continued to work these mines only on a small scale, if they worked them at all. Whether they worked the iron mines of the Forest of Dean after the departure of the Romans we have no means of knowing, but we may be tolerably sure that they did not continue to carry on the great imperial armoury at Bath. This

¹ Somerset, Hereford, Gloucester, Chester, and Lincoln.

was essentially a military establishment worked by military artisans who would be withdrawn with the troops. If the Britons had been able to continue it, they might have been able to supply themselves with an equipment that would have fitted them to contend with more success both against Picts and Teutons.

But though the wealthier and more influential section



ROMAN BRICKWORK, COLCHESTER CASTLE.

Poulton, photo.

of the Romans in Britain may have left the island with the imperial troops, and the urban population generally have disappeared as such before the Anglo-Saxons, a Roman or Romano-British element may nevertheless have survived among the agricultural population. There is not much direct evidence of many Roman agricultural settlements having been made in Britain. The only British towns that are known to have had the rank of

Roman colonies are Colchester, York, Gloucester, and Lincoln. St. Albans was a municipium.¹ But it is not to be supposed that these are the only places where Roman settlers were to be found. In the manor of Hitchin Mr. Seebohm found distinct evidences of a Roman agricultural settlement,² and there may have been many others elsewhere. The great development of agriculture under Roman rule already mentioned is at least proof sufficient that there was a large agricultural population in Britain more or less Romanised. It may well be supposed that the Anglo-Saxons would not be eager to exterminate this population, but would be only too glad to secure them as slaves, and in that capacity a number of them may have survived. To the argument that in that case the Anglo-Saxons would not have remained so long wholly unacquainted with and uninfluenced by Christianity, seeing that Roman Britain was already Christianised, it is replied that we have no good reason to believe that the Romanising and still less that the Christianising of the rural population had proceeded very far. As evidence of the importance of the Christian Church in Britain as early as 314 we have the fact that the council of Arles in that year was attended by three British bishops. But the position that Christianity had at that time acquired in a few of the towns is no proof of the hold that it had attained on the rural population, and the Latin inscription on the urn that has come down to us from Anglo-Saxon times is distinctly pagan in character. This argument therefore is of little weight. But there remains the difficulty of believing that any large remnant of a previous population, whether speaking a Celtic language, or Latin or

¹ Bury's *Gibbon*, vol. i. Appendix, n. 2.

² *English Village Community*, 3rd ed. (1884) pp. 425-432.

both, can have survived among the Teutonic invaders without leaving more traces in the language than either one or the other has done. In view of that fact the supposition that Britons in an island still only very partially settled steadily gave way before the Angles and Saxons when conquered, and sought a refuge in other districts, seems to be the more probable.

2. The Work of the Anglo-Saxon and Scandinavian Settlers

Without, therefore, denying the probability of some admixture of an earlier population among the Teutons of Britain, we may refer to these invaders—Jutes, Angles, Saxons, Danes, and Norwegians—most of the work that was done in England in the long period of 600 years between the departure of the Roman troops and the arrival of the Normans. And that work was the gradual extension of the agricultural area, the clearing of forests, the making of marshy river valleys fit for cultivation and habitation. It was thereby that they earned for themselves the right to distribute their own place-names over the length and breadth of the land. The work went on slowly indeed, but on the whole, we may reasonably suppose, it went on steadily, notwithstanding the interruptions due to invasions and internal warfare. The influence of these disorders is apt to be exaggerated in our minds when we read the records of wars of 600 years crowded into a few pages. We are apt to forget the intervals of peace, which now in one part, now in another, allowed a whole generation to pass without experience of war. And even when protracted wars are raging we may overestimate their influence in interrupting the works of peace. The well-known story of Alfred the Great may serve to remind us that even in the height of war not

only must cakes be baked, but seed must be sown, harvests reaped; there is still marrying and giving in marriage, building and draining. Professor Thorold Rogers was struck with the extreme rarity of any allusions to the Wars of the Roses in any of the documents of that period he examined during his investigations with respect to agriculture and prices; and though he attributes that to the peculiar character of that war, as merely a contest between the leading barons of the kingdom, in which they and their retainers alone were directly involved, yet in all wars which are not actually wars of extermination the works of peace must still go on in many a village where perhaps the events of the war interest the inhabitants only as matters of news, more exciting it may be, but of less moment than the daily concerns of their own labour.

3. Reasons for the Slow Progress of Anglo-Saxon Settlement

No doubt unbroken peace for 600 years, if such a condition of things had been possible, would have greatly hastened the settlement of the country, but there were other difficulties to contend with which quite account for the fact that that settlement proceeded at a much slower rate than that of a new country suitable for Europeans at the present time, or even 200 or 300 years ago. Tools must have been less efficient than now, and relatively much dearer, which would mean in effect that they were less numerous in proportion to the number of people requiring them. This would be a hindrance in every operation. Nowadays a couple of mining prospectors in the mountains of British Columbia will hew down a tree and build a hut for themselves in two

days—fitting it at the same time with a convenient stove manufactured for the purpose. We cannot tell how much labour a similar task would involve at the time of the Anglo-Saxon invasions, but we may guess that it would be a good deal more, and in the end there would be no convenient stove, but only a clumsy hearth. Then the settlers had no agricultural implements with replaceable parts, well contrived to carry out the various operations of husbandry with the minimum of labour; no railways and steamers to carry their produce to distant markets in exchange for manufactures. According to the estimate of Mr. Seebohm, about 5,000,000 acres are calculated to have been under the plough in the counties enumerated in Domesday at the end of the Anglo-Saxon and Danish periods. In the last twenty years of the nineteenth century the area under the plough in Manitoba rose from next to nothing to above 2,000,000 acres. But Manitoba is no fair comparison to make, as there no forests had to be cleared, and in the parts where the increase has taken place no marshes to be drained. A more instructive comparison may be made with the settlements of the Puritans in New England in the early part of the seventeenth century, when the conditions of the country settled were more similar to those of the England settled by the Anglo-Saxons, and the other conditions not so diverse as they are now. The first settlement in Massachusetts was made in 1620 on Cape Cod Bay, and the next, a much larger one, in 1628-29 on different points in Massachusetts Bay. At first the settlers were greatly straitened for the means of subsistence, a hardship which perhaps the Anglo-Saxons had not to undergo, since they would seize on the crops of the conquered Britons. But the Puritan settlers quickly experienced the advantage of belonging to a highly

civilised community. Soon bountiful crops were reaped,¹ whereas in England, even 300 or 400 years after the date of which we are now speaking, the earliest date for which any estimates of the produce of English agriculture can be obtained,² the yield of wheat was mostly only about 8 to 11 bushels per acre, or 4 or 5 bushels of crop for 1 of seed. In the Massachusetts Bay settlements thread and yarn were at first spun and knit by the women at home, but in a few years weaving and fulling mills were set up and became remunerative. In England these were the occupations of women throughout the Anglo-Saxon period, and the raw material for the most part was itself the produce of the village or small isolated community in which it was spun and woven. In Massachusetts brickmakers and masons, besides other artisans, soon found employment. In Anglo-Saxon England the art of brick-making was, if not unknown, at least not widely practised. Any bricks used in building by the Anglo-Saxons must have been derived from Roman buildings. Stone also was little used for building by the Anglo-Saxons. No buildings of stone, according to Freeman,³ are likely to have been built in the Teutonic parts of Britain before the introduction of Christianity, or about a century and a half after the invasion of Hengist; and Bede, in his life of Benedict Biscop, mentions that when that prelate was building the monastery at the mouth of the Wear about 675 he went over to Gaul to obtain masons to build a church in the Roman style, and afterwards sent messengers to Gaul to bring over makers of glass, "a kind of workman at that time unknown in Britain."⁴

¹ Winsor, *History of America*, vol. iii. p. 316.

² See below, pp. 293, 294.

³ *Norman Conquest*, vol. v. p. 608.

⁴ Though at an earlier date the art of making glass beads and vessels does appear to have been known in Anglo-Saxon Britain, if at least the

A still more striking difference between the condition of the Anglo-Saxon settlers in England and that of the English Puritans in Massachusetts is the early date at which foreign commerce across a wide ocean was started by the latter community. The Anglo-Saxons remained practically isolated from the neighbouring Continent except as regards the relations of the Church. The first ship was launched by the community on Massachusetts Bay in 1631, only three years after the first settlement, and in 1642 a large ship loaded with fish was despatched to Bilbao in Spain and returned with a cargo of wine, fruit, oil, and wool.¹

4. Commercial Relations with the Continent

The re-establishment of commercial relations with the Continent is one of the important effects due to the Scandinavian settlements in England. The Norwegians and Danes, accustomed to a sea life, early carried on trade as well as piracy, and after their conversion to Christianity piracy for the most part died away and trade increased. For the first time after the departure of the Romans we hear again of London as a centre of trade with the Continent in the reign of Edgar (959-975) under the ministry of Dunstan. About that time London seems to have been already in trade relations with Cologne, Liège, and Rouen. The first two of these towns point to the early importance for this country of the markets reached by the two great waterways to which the mouths of the Rhine gave access; the third is an indication of the relations already established between England and discovery and remains in Anglo-Saxon tombs is to be taken as proof of Anglo-Saxon manufacture. See Baron de la Baye, *Industrial Arts of the Anglo-Saxons*, ed. 1893, pp. 76, 104, 105.

¹ *Tenth Census Report of U.S.*, vol. xviii., pp. 148, 149.

Scandinavian settlers on the Continent. A list of commodities on the London market about the same date is also interesting. They included pepper and spices, which we may take as an indication that the Rhine waterway had already brought England into indirect connection with the far East; gloves and gray cloths, which are no doubt also to be included among imports; sacks of wool, which may be taken with equal confidence to be of English origin and destined for export; iron-work from Liège, which has never ceased to be a great iron-working town; French wine and vinegar; together with cheese, butter, lard, eggs, swine, and fowls, all these last being, beyond question, native produce.¹

To the influence of the Scandinavians also is ascribed the regrowth of towns in England as centres of trade.² The Anglo-Saxon villages, in keeping with the rivalry that subsisted between the petty kingdoms and sub-kingdoms, lived not only in mutual isolation, but in mutual jealousy. A stranger was a foreigner even if only a stranger of another village, and Mr. Cunningham observes, as an illustration of this, that market towns in many cases grew up on the frontiers of the village (parish) settlements—a sort of neutral spot, where men could agree for mutual convenience to lay aside or suppress for a time their mutual distrust.³ The towns themselves, however, grew up under the same feelings of mutual jealousy, and it was centuries before the barriers with which they managed to gird themselves round were finally and completely broken down.

¹ Loftie, *History of London*, Appendix, p. 419.

² Cunningham, *Growth of English Industry and Commerce, Early Period*, pp. 88, 89.

³ *Ibid.* p. 76.

CHAPTER XV

THE NORMAN CONQUEST AND ITS RESULTS

1. Immediate Effects of the Conquest in England

THE Conquest of England by William of Normandy, begun at the battle of Senlac in 1066, was completed with great rapidity. The south-west, the midlands, and the north (Yorkshire and Lincolnshire) were successively overrun and brought to subjection in 1068. A rising in the north in the following year was suppressed with merciless fury in 1069-70, the vales of York and Durham being laid waste and almost unpeopled, and finally Chester was taken in 1070 after a winter march from York.

This Conquest is of great importance with reference to our present subject in several respects. It is the last conquest that England has ever undergone. It may even be said to be the last occasion on which England was ever invaded by a foreign force from beyond the sea, for the landing of Louis of France in the reign of Henry III., and those of Monmouth and William of Orange, can hardly be classed under this head. Since the Conquest England has always remained a strong united kingdom, united at least against all foreigners, settling her own internal quarrels without external interference; and as a further indication of the importance of the sea-barrier

by which she is cut off from the mainland of Europe, it may be pointed out that only on rare and exceptional occasions has England ever landed a force on foreign soil except where she already had a foothold or the countenance of a friendly power.

The Norman Conquest is not only the last foreign conquest and last foreign invasion of England, it is the last intrusion of a foreign element that has had any effect on the structure of the language, and any general effect on the composition of the population.

With regard to the population now introduced two facts must be borne in mind. First, though speaking a French language the Normans were at least in large part of kindred blood to the Teutonic stock already in England. They were descendants on one side, if not on both, of Danes, the same people who had settled so largely in the eastern parts of the country between the Nen and the Tees. Second, the settlement of the Normans in England did not to any large extent displace the population of England. It made changes in the great land-owning class, displacing the great land-owners, who in feudal language held directly of the crown, but leaving the bulk of the population as they were. This displacement, moreover, did not take place uniformly over the kingdom. The demands of William's followers could be met without a universal expulsion of the English tenants-in-chief. Accordingly some parts of the country were treated in this respect more mildly than others. While in Kent every acre of the land was transferred to a Norman tenant-in-chief, in Wilts and Notts, and to a greater extent in Lincolnshire, such landowners were allowed in some cases, on swearing allegiance to William, to retain under him what they had held under the previous kings. In addition to that tenants-in-chief who

had been dispossessed were enabled in some cases to redeem their lands. The Conquest thus created a new dominant class of considerable numbers, but otherwise did not greatly disturb the existing population, except in the severely harried regions of the north.

2. Effect of the Conquest on the Relations of England with the Continent

Another important effect of the Conquest was that it brought England once more into close relations with the Continent, and thus opened her up to the civilising influences from which she had been in a great measure cut off since the departure of the Romans.

Gaul, it must be remembered, had been more thoroughly Romanised than Britain, and the barbarian tribes that entered it had established themselves there in a totally different manner from that which, we have seen, was likely to have been the mode of settlement of the Anglo-Saxons in Britain. In Gaul the conquerors rapidly adopted the civilisation and with it the language of the people among whom they settled. Notwithstanding the disorders that led to the overthrow of the Western Roman Empire the countries round the Mediterranean still remained the chief seats of civilisation in Europe. The splendid empire of Charlemagne had had its centre in Gaul or France, which continued throughout to be in uninterrupted communication with Italy and Rome. Thus the Danes in Normandy rapidly attained a degree of civilisation far ahead of that of the Anglo-Saxons or their kinsmen in England. In France, in fact, they had become partakers of the civilisation inherited from the Romans, and they were thus in a manner able to renew in England the work of Rome which had there been

interrupted by the Anglo-Saxon invasions. This higher civilisation was shown first in the higher organisation and better equipment for war. It was the cavalry and superior armour of the Normans that chiefly won the battle of Senlac. That superior equipment betokened a more highly developed trade in Normandy than in England, and that trade was bound to be kept up after England had been conquered.

A still more striking evidence of the higher civilisation introduced by the Normans is presented by the large numbers of stone buildings, castles, monasteries, and churches which they at once began to erect in England over the whole length and breadth of the country. Large numbers of skilled masons must have been brought into the country, and their presence and work cannot fail to have had an important effect on many of the handicrafts pursued in England.

The effects of the Norman Conquest on the language of the country are notorious. A Romance language was introduced and became for a time the language of administration, and though it never became the language of the people its influence broke down the grammatical structure of the Teutonic language then spoken in England, began the intermixture of the language with words of Latin origin, deprived it of its native power of growth to meet the demands of increasing culture, compelling it to resort for that purpose to words of Latin and Greek origin. There can be little question, moreover, that the efforts of the Normans to pronounce a language so unlike their own as that spoken by their English subjects must have had a rapidly corrupting effect on the pronunciation; and it is probably to this cause we must ascribe the fact that in English, and especially in the simpler and more ordinary words, there is an amount of

irregularity in the relation between the sound and the spelling probably without a parallel in any other language. English, the new language formed by the influence of Norman-French on Anglo-Saxon, was finally victorious over Norman-French within three centuries after the Conquest. In 1363 the pleadings in the higher courts of law were in English instead of French.¹

3. Settlement of the Boundary with Scotland

To the Norman period also belongs the final fixing of the boundary between Scotland and England. It has already been mentioned that early in the reign of Cnut the King of Scots had extended his dominion to the Tweed, as it had previously been extended to the Solway. Even after that date the district of Lothian between the Forth and the Tweed was looked upon by some as belonging to England, and held of England by the Scottish kings. After the battle of the Standard (1138) Northumberland and Cumberland were added in a sense to Scotland, through being granted as fiefs of the English crown to Henry, son of David the Scottish king, but ultimately the boundary was fixed along a line drawn across the Cheviots from the Solway to the Tweed, and then down that river to the vicinity of the sea.

Here we may point out that if the two countries were to be divided at all the boundary that ultimately came to be chosen was almost ideal under the circumstances in which the division was made. First, we must note that these circumstances were totally different from those in which a frontier wall had been erected by the Romans in the time of Hadrian and Antonine. The Roman walls both ran in a comparatively straight line across com-

¹ Freeman, *Norman Conquest*, vol. v. p. 536.

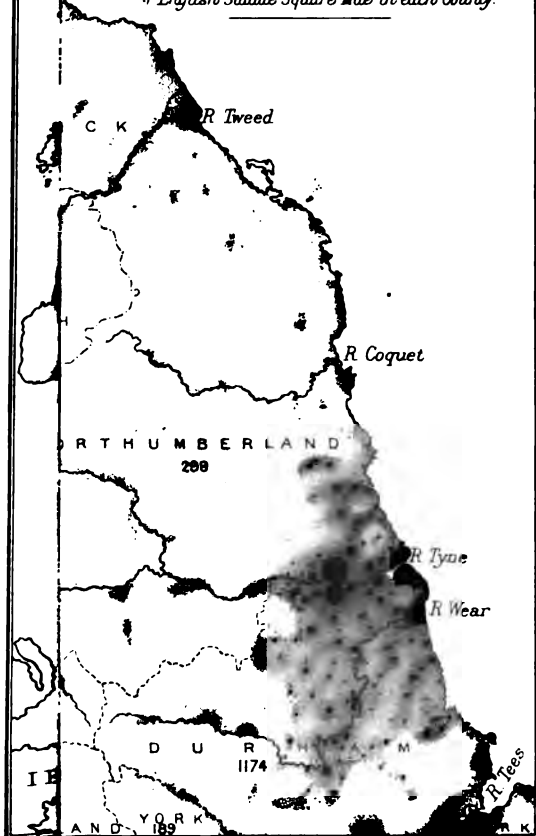
paratively narrow tracts of country and through fertile lowlands. Their whole purpose was to mark off and render easily defensible a frontier against barbarians. It was important, therefore, that the wall should not be unnecessarily long, and in those times that it should run through a country from which it was easy to draw supplies. These conditions were fulfilled in both the situations where the Roman walls or ramparts were erected.

But when England and Scotland came to be divided, two more or less civilised powers had grown up with different centres. The centre for England was towards the south, all the more absolutely so since the ruthless harrying of the only populous region in the north, that between the Humber and the Tees, by William the Conqueror.

The centre for Scotland was on the borders of the Firth of Forth, round which the bulk of the population was necessarily settled. If these two powers were to effect a final breach, it was natural that that breach should take place where the cohesion was least, or in other words, where the population was least dense, and was by the nature of the surface ever bound to be so. The section across the Cheviots from the Solway to the Tweed is just that line. The accompanying map, showing the distribution of population in that region in 1901, might probably have served almost equally well, so far as the shading is concerned, to represent the distribution of population in that region at any previous period after the establishment of the kingdom of Scotland, except that in earlier times a much lighter shade would have represented the basin of the Clyde. Hence it was as natural that the two kingdoms, if they were to break off at all, should break away at that line as that an hour-glass, when any transverse strain was applied, should break in the middle. The boundary between England

A MAP OF THE
SOUTH OF SCOTLAND
 AND
NORTH OF ENGLAND
 Showing the density of Population
 1901

The Shading exhibits the various degrees of density of population.
The Black Spots represents the Towns with more than 1000 inhabitants, the size of the spots being proportioned to the population.
The Figures denote the number of persons to 1 English Statute Square Mile in each County.



Stanfords Geograph. Estab. London.

and Scotland is similar to that between Spain and Portugal, along the line of scanty population, marking off on the west the more fertile and populous tracts on the lower Tagus and the lower Douro, or that between the Netherlands and Germany, through the thinly-peopled district of the Bourtanger Moor. East and west of the sheep pastures of the Cheviots the tract of arable land between these hills and the sea is very scanty, and in the east the border is marked by a river broad enough to serve as a good line of defence. On the west the tract of arable lowlands between the Cheviots and the Solway is even of less extent, and to make their frontier more easy of defence the English here secured for themselves the bog known as Solway Moss, above the head of the Solway between the Esk and the Sark. The natural character of this boundary, the degree to which it was determined by geographical conditions in accordance with the circumstances of the time, is shown by the manner in which it came to be established. There is no record of any formal agreement on the subject. Boundary commissioners were appointed for the purpose of adjusting the marches early in the thirteenth century, but this seems to have led to no definite result. The boundary was regarded as settled by usage. This, however, does not apply to the then important town of Berwick-upon-Tweed. It remained long in dispute between the two countries. It was claimed as Scottish till 1334, when it was first formally surrendered "for ever" as a possession of the English crown. It had, however, been mainly in English hands from the time of its capture by Edward I. in 1296 except during the period 1319-33. It was once more handed over to the Scotch in 1461 by Henry VI., but was finally recaptured by the English in 1482.

CHAPTER XVI

POPULATION OF ENGLAND—DOMESDAY TO 1800

1. Reasons for the Division here Adopted

WE have now arrived at the time when England is fully formed. In the ensuing chapters the most convenient course will be to consider the development of England under various heads, with the view of observing the operation of geographical conditions under each. But seeing that the true nature and effect of geographical conditions in England have probably been more abruptly, if not more profoundly, altered by the change in economic conditions best associated with the name of James Watt than by any other outgrowth of time, it will also be convenient to divide the period between Domesday and the present time into two sections, the first ending when the change referred to began to take effect. For this reason the year 1785 might, perhaps, have been the best dividing line; but as the number and distribution of population are the best available expression of the result due to the action of the various conditions that geography must take into account, and as the first year of the present century is the earliest from which we have regularly recurrent data on the head of population, the year 1800 is that which it is

best at least to name as the closing year of the first section.

For the reason stated in the last sentence, the first chapter dealing with this action is devoted to population, and the importance of this subject, together with, unfortunately, the uncertainty of the data with which we have to deal, necessitates a chapter of exceptional length.

2. Domesday Book

From the early part of the Norman period comes the first statistical work dealing with England, Domesday Book, the primary purpose of which was to determine the due assessment of the geld (the original heregeld and afterwards Danegeld), the tax levied on the land for the maintenance of an armed defensive force. To us, however, the great value of this work consists in the information it affords as to the number, condition, and occupations of the people. The census on which it is based was completed in a short period in 1085 or 1085-86, but the uncertainty just referred to is experienced in dealing with the figures it contains. In the first place, this register does not embrace the whole of England. It omits London, Winchester, and several smaller places, besides the counties of Northumberland, Lancashire, Westmorland, and Cumberland, except a part of the last county then reckoned as belonging to Yorkshire. Accordingly, if it is to be applied to the whole of England, estimates of the nature of pure guesses must be made for the omitted areas. Moreover, it omits the clergy and members of monastic bodies, and in estimating the population guesses must be made for these also. But in addition to that there is uncertainty as to the interpretation of the figures relating to

London, that fact alone makes such an estimate to me incredible. But when we add that Domesday classifies the population, and enumerates, for instance, 108,407 villani, each of whom probably had a holding of 30 acres, or of 15 acres,¹ the fact that each villanus stands for a household can hardly be doubted. Such, however, is the evidence, and the reader must judge for himself. I am disposed to side with those who would use a multiplier in arriving at the whole population, but it should be noted that the choice of the multiplier must be somewhat arbitrary. Ashley² treats the figures thus:—Allowing for the omitted areas and sections of the population he estimates the total number of households at 300,000, and by multiplying by five he arrives at the total population for England, and some such estimate is what is usually taken.

With regard to the relative distribution of population the figures in Domesday are equally good, whether we take them as representing households or individuals. Using the same multiplier, however, and taking the present areas of the counties, we obtain the following results for different sections of England:—

	Aver. pop. per sq. m.
S.-E. Counties (Kent, Surrey, Sussex)	35
Counties on North Sea between the Wash and the Thames (Norfolk, Suffolk, Essex)	63
S.-E. Inland Counties (Cambridge, Hants, Beds, Herts, Middlesex, ³ Bucks)	37
Lincolnshire	38
Yorkshire	7
E. Midland Counties (Notts, Derby, Leicester, Rutland, Warwick, Northants, Oxford)	35
West Border and Midland Counties (Cheshire, Stafford, Salop, Hereford, Worcester)	25

¹ That is, virgates or half-virgates.

² *Economic History*, vol. i. p. 69 and note.

³ Exclusive of London.

	Aver. pop. per sq. m.
Middle Counties between the Thames and the Channel (Berks, Wilts, Hants, ¹ Dorset)	37
Gloucester and Somerset	39
Devon and Cornwall	29

The striking figures in the preceding table are those showing the exceptionally dense population between the Thames and the Wash, and the remarkably sparse population of Yorkshire. The small area of the parishes, and the great number of large churches at short intervals from one another, especially on the coast, in the counties between the Thames and the Wash, are still a striking indication of the relative populousness of this region in the centuries subsequent to the Conquest.

3. Population in 1377

The next definite figures we get as to the population are for the year 1377, but these figures also require interpretation and manipulation. In that year Parliament granted a poll-tax on every person above fourteen years of age with the exception of known beggars. The numbers on whom this tax was levied has been recorded except apparently for the clergy. But it is to be noted that Durham and Chester, not being represented in Parliament at that date, were not embraced in the returns based on that tax, and accordingly an estimate (guess) must be made for them. Estimates must also be made for the children below fourteen and for the clergy. If Wales, which then included Monmouth, is to be included in the total population an estimate must be made for it also. The figures have been handled by different authorities, and I will here note the results of those calculations with

¹ Exclusive of Winchester.

which I happen to be acquainted. These results, it will be noted, are not unreasonably divergent. Professor Thorold Rogers has arrived at a total population for England and Wales of 2,184,000.¹ A writer, quoted in the *Journal of the Statistical Society*,² estimates the total at about 2,350,000, Mr. Seebohm at 2,500 000.³ If Wales be excluded the results are roughly 2,050,000, 2,220,000, and 2,350,000.

At this date we get a fair approximation to an agreement, but with regard to a period thirty years earlier there is a very remarkable diversity of opinion. About that date the population was suddenly reduced in a terrible manner by the great plague known as the Black Death. The Black Death is first recorded to have appeared in Dorsetshire on the 1st of August 1348. Before the close of the year it had reached London, and in that and the following year it is variously estimated as having carried off from one-third to one-half of the population. The detailed investigations that have been made with respect to its ravages in certain districts seem to make it likely that the higher proportion is nearer the truth than the lower.⁴

Considering the effect of this appalling calamity, one would naturally suppose at the first blush that the population at the outbreak of the plague was considerably higher than it was thirty years later, at the date to

¹ *Industrial and Commercial History of England* (1892), p. 48.

² Vol. iv. p. 201.

³ *Fortnightly Review*, vol. ii. p. 153. (See Macpherson, *Annals of Commerce*, vol. i. p. 592, for the mode in which this total, which Mr. Seebohm has adopted from Macpherson, is arrived at.)

⁴ See Mr. Seebohm's article in the *Fortnightly Review* just cited; Jessopp, *The Coming of the Friars*, 6th ed. pp. 206, 207, etc.; Cunningham, *Growth of English Industry and Commerce, Early and Middle Ages*, p. 305, n.

which the figures just given refer. But Professor Thorold Rogers contends that the population before the plague cannot have been much higher than that calculated for 1377. "If I had no other proof," he says in the posthumous work already cited,¹ "than that of the average production of wheat in favourable years, on which I happen to be specially well informed, when I write or speak about the facts of five centuries ago, I should be convinced that England and Wales did not and could not maintain more than two and a half million souls at that time." The loss by the plague must, accordingly, have been nearly made up by the year 1377. Mr. Ashley seems to have accepted Professor Rogers's conclusion.² On the other hand, Mr. Seeböhm, also arguing from the data of 1377, thinks the population before the plague must have amounted to 5,000,000, contending that the unsettled state of the country and the recurrence of the plague in 1361 and 1369 would prevent any increase of population between 1349 and 1377.

If any conjecture might reasonably be made on the basis of the known or probable rate of increase of population in England, or England and Wales, at any like period at a later date one might conclude that both these views are extreme. To take the most favourable parallel to Professor Rogers's view, let us suppose that the population between the plague and 1377 increased at the same rate as in the first three decades of the present century, a mean rate of 1.51 per cent per annum, almost the highest recorded for any period of that length, then taking Professor Rogers's own estimate of the 1377 population, and assuming that half the population was

¹ *Industrial and Commercial History of England*, p. 47.

² *Economic History*, p. 114.

destroyed by the plague, we find that the total population before the plague must have been nearly 2,800,000; on Mr. Seebohm's estimate of the 1377 population it would be about 3,200,000 (it is absurd to be too nice in calculations based on such problematical data). If, on the other hand, we suppose the rate of increase to have been the same as in the first three decades of the eighteenth century, a mean of 0·19 per cent per annum, one of the lowest on record, then on the same assumptions the populations arrived at for the period before the plague would be respectively about 4,180,000 and 4,725,000.

Even the most favourable of these suppositions, accordingly, does not bring the population before the plague down to so low a limit as that fixed by Professor Rogers, and we can hardly suppose that the rate of increase in the period in question was even higher than in the early part of the present century without very strong evidence derived from other facts. But when we examine the independent evidence on which Professor Thorold Rogers's strong conviction as to the maximum population of England and Wales in the fourteenth century is based, we find that on his own showing so much is "assumed,"¹ that one has no confidence in supposing the rate of increase of population that he imagines. On the other hand, the conditions immediately after the plague were in some respects at least extremely favourable to a rapid increase of population. A large area was ready for the plough for which only hands were wanting. The demand for labour was accordingly very great, and wages rose rapidly in spite of Acts of Parliament. For fifty years after the plague there were good harvests and cheap food.² In these circumstances

¹ *Agriculture and Prices*, vol. i. p. 57.

² Ashley, *Economic History*, vol. i. part ii. p. 355.

one is inclined to surmise that, notwithstanding the unsettled times and the recurrence of plague in 1361, Mr. Seeböhm's assumption of no increase in the population before 1377 is somewhat violent.

But in all this what is most certain, and what perhaps it is most important to bear in mind, is that it is all very problematical, and that our results may be indefinitely varied in accordance with the variations we may reasonably enough make in our assumptions. We may, perhaps, also conclude that 5,000,000 was the maximum for the population of England and Wales immediately before the plague, and two and a half millions the minimum, not, as Professor Rogers would have it, the maximum. Absolute figures being left out of account, undoubtedly the most important fact of all is the tremendous reduction of population which unquestionably took place within one year in 1348-49.

4. Population at the End of the Sixteenth Century

After 1377 the next figures we have applying to the country as a whole are two accounts of the muster roll of fighting men, one for the year 1575 and one for 1583, but both agreeing in placing the number at 1,172,000.¹ If this number can be taken as authentic it affords a good basis for making an approximate calculation of the whole population. We are safe in assuming that the females would be at least equal to the males of the same age, but what proportion should be allowed for those above and below the fighting age is more doubtful. The writer in the paper quoted, basing his estimate on the fact that the age of twenty divides the male population into two equal parts, and observing that the "stout boys"

¹ *Journal of the Statistical Society*, vol. iv. p. 202.

below that age who might be enrolled as fighting men might be fairly set against the old men who could not be so reckoned, multiplies by four, and thus arrives at a total population of 4,688,000 for that date. Even if the multiplier four be excessive it can hardly be so much in excess as to allow us to suppose that the population was very much below that number, if the figures on which the calculations are based are authentic.

Professor Thorold Rogers, however, again contends for a very small population in the sixteenth century, and as the facts on which he relies are interesting with respect to the distribution of population at that time, it is worth while to state his argument, though it will be necessary to point out some oversights which affect its validity. His most important fact is found in a record of the population of nine hundreds in the east of Kent, in a document which, he says, must be referred to the latter part of the reign of Henry VIII.¹ These hundreds are Middleton (without doubt the present Milton), Teynham, Feversham (Faversham), Boughton, Wye, Felborough, Downhampford, Kyngesloe, and Bleangate. They lie, Professor Rogers states, in the richest agricultural district of Kent, a decidedly prosperous part of England, he adds, in the first half of the sixteenth century, a fact which there is no reason to doubt. They contained no large town at that time and contain none now.² He accordingly takes these hundreds as typical of agricultural England in its most favourable aspect. Now the population given for these hundreds in the document which he quotes is 14,813; in 1871, the population of the same hundreds was 88,080. At about the time of the census of 1871 England was estimated to be capable of maintaining with

¹ *Agriculture and Prices*, vol. iv. p. 132.

² *Commercial and Industrial History*, p. 49.

the produce of her own agriculture about 15,000,000 of people, while in the sixteenth century the population were of course entirely dependent on their own produce. Accordingly, Professor Rogers argues the whole population of England at the date of the document he quotes may be estimated to have borne the same ratio to 15,000,000 as 14,813 bears to 88,080, that is, one-sixth. His estimate of the population in the latter part of the reign of Henry VIII., therefore, is about two and a half millions. By a similar argument, based on the enumeration of houses in eight parishes (not all named) about the end of the century, he calculates that the population at that date had undergone no material increase.¹

We will consider first this argument as based on the larger area. The first thing to point out with reference to it is that while it is quite true that the nine hundreds named contained no large town in the sixteenth century, and contain no large town now, they do contain the watering-places of Margate, Ramsgate, and Herne Bay, which have increased in population for special reasons since the beginning of the present century out of proportion to the purely agricultural districts of England. The hundred of Kyngesloe or Kingslow, as we now spell it, is the same as the Isle of Thanet, containing Margate and Ramsgate, and that hundred alone accounted for more than two-fifths of the total population of the nine hundreds in 1871. Two-fifths, I should say, of the correct population of these hundreds, for it must also be pointed out that Professor Rogers has omitted to include Margate in his total for 1871, though it has been a separate borough only since 1857, and its population would certainly be included in that of the hundreds in the time of Henry VIII., while he has included the borough

¹ *Commercial and Industrial History*, p. 51.

of Faversham,¹ which has been a chartered borough since the time of Henry III., and the population of which may possibly have been omitted from that of the hundred in the time of Henry VIII. If Professor Rogers, therefore, had applied his argument to the correct total of the hundreds including boroughs, namely 100,075, he would have arrived at a total population of less than two and a quarter millions for the middle of the sixteenth century, which might perhaps have given him pause.

But certainly, in view of the special causes that have in later times affected the growth of the three watering-places mentioned above, which in 1871 contained more than three-tenths of the population of the hundreds, it seems to me that it would have been more reasonable, if we employ such an argument as that of Professor Rogers at all, to apply it to the returns of the first census, when the special causes referred to had had less effect on these places. The total population of the nine hundreds at that date (1801) was 41,008, and if we assume that English agriculture could then maintain all the population of the country (8,351,000 in England only, 8,892,000 in England and Wales), we then arrive at a population of nearly 3,000,000 for England, and one of 3,175,000 for England and Wales.

We thus see again that our suppositions may be reasonably enough varied, and that as the suppositions vary so also do the results. As the argument based on the larger and more important area is thus seen to be incapable of standing a close examination, that based on

¹ The nine hundreds, with the omission and inclusion mentioned in the text, contained, according to the 1871 census, exactly 88,080 inhabitants. It is from this fact that I concluded that Professor Rogers was dealing with the census of 1871, as might be gathered from *Agriculture and Prices*, vol. iv. p. 132, and not with that of 1861, as stated in the posthumous *Commercial and Industrial History* (p. 49).

the eight unnamed parishes in the latter part of Elizabeth's reign (an argument which has doubtful elements of its own) may be dismissed. Such evidence, Professor Rogers held, was overwhelming, and satisfied every condition of proof.¹ To me it seems that it would be more just to say that evidence with respect to the matter in hand satisfying every condition of proof it is impossible to obtain, and that these particular arguments are not very forcible in face of the definite returns as to the number of men capable of bearing arms at the later date.

But we are none the less indebted to Professor Rogers for having in the course of his vast and assiduous researches brought the fact on which his first argument is based to light. The fact itself is interesting and important. The nine hundreds named are not only in the richest part of Kent, but belong to a district which has been cleared and in continuous cultivation since the time of our earliest records. Their total area is 164,398 acres, or close upon 257 square miles, and the population in the middle of the sixteenth century was thus about fifty-eight to the square mile, little more than that of Caithness in 1891. Although one may not see how to base a definite estimate for the whole population of England and Wales at the time on this one fact, still we must note that this population is remarkably small, and it may fairly be appealed to as pointing to the smallest estimate that may be made consistently with other data belonging to the period. If, therefore, I may be allowed to hazard a guess for the total population of England and Wales about the end of the sixteenth century, I would rather say about four and a half than four and three quarter millions. Mr. Cunningham seems willing to accept an estimate (between two

¹ *Commercial and Industrial History*, p. 51.

or three millions)¹ for the reign of Elizabeth nearly as low as that of Professor Rogers, but on what grounds he does not state.

5. Population 1688-1790

The next estimates are those based on the hearth-tax returns, which give us the number of the houses at certain dates. It is mainly on these returns that Macaulay bases his estimate of the population of England at the date of the Revolution of 1688 at from five to five and a half millions.² Professor Rogers, estimating a smaller proportion for each house, would make the population less than 5,000,000.³

After the abolition of the hearth-tax in 1690 the estimates are based on the registers of births and deaths, and the following table gives the population obtained in this way, under the "Population Acts," for the last year of the seventeenth and the last year of each decade of the eighteenth century:—

POPULATION OF ENGLAND AND WALES, 1700-1790

Year.	Population.	Increase or Decrease per cent.	Year.	Population.	Increase per cent.
1700	5,475,000		1750	6,467,000	6·64
1710	5,240,000	- 4·92	1760	6,736,000	4·16
1720	5,565,000	+ 6·20	1770	7,428,000	10·27
1730	5,796,000	4·15	1780	7,953,000	7·07
1740	6,064,000	4·62	1790	8,675,000	9·08

As the total population of England and Wales at the census of 1801 was only 8,893,000, showing an increase in eleven years of only about $2\frac{1}{2}$ per cent, a much lower rate, as the previous table shows, than in any

¹ *Growth of English Industry and Commerce, Early and Middle Ages*, p. 304, n.

² *History of England*, beginning of chap. iii.

³ *Agriculture and Prices*, vol. v. pp. 77, 78.

period since 1720, while the rate of increase in every decade since the first census has exceeded 10 per cent, it may be fairly surmised that the estimate for 1790 is too high. Possibly all the estimates for the eighteenth century may be somewhat too high, though they are certainly likely to be nearer the truth than any estimates for previous centuries. It has indeed been pointed out that the low rate of increase 1790-1801 is at least partly explained by wars abroad, troubles at home, and bad harvests (1795 and 1797), but two of these causes, war and bad harvests (1801 and 1809) were at work also in the first decade of the nineteenth century, when the increase in England amounted to 14·4 per cent, in Wales to 12·8 per cent. In the absence of any other explanation of such a wide discrepancy our suspicion may be said to rise almost to a certainty.

CHAPTER XVII

ENGLISH AGRICULTURE—DOMESDAY TO 1800

1. Cultivation on the Open Field System

THE preceding chapter shows how slow the increase of population was before the eighteenth century. This is chiefly to be explained by the condition of English agriculture. Down to the eighteenth century, indeed, agriculture was the one English industry of great importance. Commerce for many centuries was limited, and the only great article of export, wool, was one that did not require for its production a great amount of human labour. Minerals were relatively unimportant, and manufactures for distant sale, as Adam Smith calls them, did not arise till about the fifteenth century. For all these reasons, in a consideration of the causes of this slow growth of population, the first place is due to agriculture.

Judged from the modern standpoint the mode of agriculture pursued in early times was highly remarkable, and as it was quite incompatible with a high rate of production, some account of it, however brief, is indispensable. The agricultural villages with which England gradually became covered all cultivated their lands, from as early a date as we know anything about them, on what

is known as the "open field system," which continued to be practised more or less down to the eighteenth, and even survived in a few instances into the nineteenth century.¹ The essential feature of this system was that the separate holdings in the arable lands of the village were not fenced off from one another in any way, and that after the harvest the fences that separated the common pasture grounds of the village in which all the live stock (cattle, horses, sheep, poultry) were kept during the time when the corn was growing, were thrown down, and the live stock allowed to wander at will among the stubble of the arable lands. From the date when these fences were usually removed, about the 1st of August, these common pastures got the name of Lammas lands.

All round the village, beyond the arable and pasture lands, there lay an uncleared area of variable extent known as the waste land, from which all the villagers obtained their firewood and all the timber they might require, and in which they might allow pigs to run freely and feed on acorns or beech-mast. Though not marked off from one another by fences the separate holdings were of definite extent, but each holding was composed of a number of long narrow strips about half an acre in extent distributed amongst all the arable land of the village, and separated from the adjoining strips of other holders by narrow balks, or strips of unploughed land. What might be called a normal holding in Saxon and Norman times was one of 30 acres, which accordingly would be composed of sixty of such scattered strips. The inconvenience of this arrangement is to some extent obvious, yet the system not only persisted for centuries, but appears to have been at one time general throughout Europe. This is not the place to inquire into the origin of such a system,

¹ See below, p. 304.

but as it cannot fail to excite astonishment among those who are not acquainted with the fact of its existence and former wide prevalence, it may not be inappropriate to mention here the most plausible explanation which, as it seems to me, has been given of such a remarkable mode of land tenure, namely, that its aim was to distribute the village lands among the different holders as fairly as possible in respect of quality and advantages of position, so that no holding was likely to be altogether of poor or badly situated, no other altogether of rich or well situated, land.¹

Manifestly the distribution of land just described implies that each village, or, as it came to be called in Norman times, manor, was occupied as a whole, a fact with which the suggested explanation is quite in keeping. But while such must have been the case the holders of the land, in England at least, differed from one another from the earliest Saxon times not only in the amount of land which they held, but also in their rank or condition. In every village the chief land-owner was the lord of the manor, as he came to be called, and from him all the others were regarded as holding their land, in return for which they cultivated the lands of the lord, each land-holder owing definite services in accordance with the land he held. In Domesday various grades of land-holders are enumerated, but these it is unnecessary to distinguish here. It is enough to say that the services which had to be done on the lord's estate were of two kinds, those which were rendered regularly on certain days in every week (week-work), and those rendered only at exceptional seasons, such as harvest-time. Most of the tenants were liable for both, but some apparently only for the latter, and as these, the tenants liable only for exceptional

¹ Vinogradoff, *Villainage in England*, p. 254.

services, or socmen, are found in largest proportion in Domesday in the counties settled by the Danes, it has been conjectured¹ that it was Danish settlers and their descendants that thus obtained peculiar privileges. Some of the holders were reckoned free, and in their case the permanency of their holding could be upheld at law; others were unfree, but in their case, though the holding was still practically permanent, it was so only by custom. What distinguished these two tenancies is not definitely known.² Slavery in the strict sense of the term came to an end in the century after the Conquest.³

Such a mode of land tenure obviously implied some community in the mode of cultivating the land, though the mode adopted was not everywhere the same. The general method in England was that known as the three-field system. According to this system two grain crops, in England usually wheat and barley, were grown on the same field in two successive years, and the third year the field was left fallow. Plainly this implies the simultaneous existence of one field of wheat, one of barley, and one fallow in order to have two grain crops every year. The field kept fallow was sown with wheat towards the end of the year. The wheat was reaped before the beginning of August in the following year, and in the spring of the year after was sown with barley to be reaped the same year. This system was not confined to England, but was in fact very wide-spread, and is still very extensively practised, as in Russia. But it was not pursued in the parts of Germany whence the Jutes, Angles, and Saxons sailed for England. On the other hand, it was general in Gaul, which was completely Romanised, and in England itself seems to have been

¹ Ashley, *Economic History*, vol. i. p. 18.

² *Ibid.* pp. 21, 22.

³ *Ibid.* p. 18.

most general in the parts that had been most under Roman influence. It has been surmised therefore that in this practice we have a relic of that influence among the Angles and Saxons continued into Norman and later times ; and this is one of the strongest reasons for believing that Romanised Britons may have survived among their Teutonic conquerors in greater numbers than is usually believed. They would be preserved of course as slaves, and as such, it is argued, would not be likely to exercise much influence except in those pursuits for which they were kept.

2. Hindrances to the Growth of Population due to the Open-Field System

It has been already said that the inconvenience of the open-field system of culture is to some extent obvious. But that is not enough. We had better consider what those acquainted with agriculture have to say on this head. While co-operation among the holders of the land might reduce the inconvenience resulting from the strips of the different holdings, the expense of many agricultural operations must have been increased. This could not but be a hindrance to improvements, such as the application of manure. Then any general system of drainage was impossible, or at least to carry it out would have involved a high degree of organisation. Without such organisation too, no individual farmer could keep his land free of weeds except by bare-following, the course regularly resorted to in the three-field system. Then the variety of crops that could be grown was limited. Those already mentioned were of course not the sole crops grown even in the earliest period of English agriculture. Rye might take the place of wheat, and oats that of barley in the

rotation. Pulses also were grown; flax also regularly to supply the fibre which was spun into yarn and then woven by the women. Hemp was more of a specialty in certain districts. But as long as the live stock of the village could be turned on the stubbles in August no green crops, such as turnips or potatoes, could be grown, no tares or artificial grasses. In early times some of these crops were unknown in England, but the open-field system lasted on long after their introduction, and the continuance of that system acted as a great hindrance to their general cultivation. The constant succession of grain crops and pulses prevented that repeated spring harrowing which the later sown turnips and potatoes afforded. The mingling of all the live stock of the village made attempts at scientific breeding too risky; but, what was even more serious for the live stock, or at least the sheep and cattle, the absence of the turnip deprived them of their staple winter food, and it was therefore impossible to keep any large number alive during the winter, and to maintain in health and good condition those which had to be preserved. Besides condemning the people to salt meat during the winter months, this would in itself prevent any great improvement in the breeds of sheep and cattle.¹

Among other defects of medieval husbandry mentioned by Professor Thorold Rogers are that the working of the soil was shallow, and the only manures used were stable dung, lime or marl, and sheep-dressing.² Agricultural implements were very defective. There is no trace of a roller having been used in the fourteenth century, or of a harrow with iron teeth. Clods were either broken by

¹ Garnier, *History of the English Landed Interest, Modern Period*, pp. 209, 223, 224. The second of the two passages cited, it should be noted, refers to as late a date as 1774.

² *Agriculture and Prices*, vol. i. p. 34.

hand labour or by a roller made of the bole of a tree manufactured on the spot,¹ a circumstance which would give an advantage to the lighter soils, even though the heavier clays might be more productive.

3. Returns on Crops in the Middle Ages

The natural result of all these defects was that the returns on the crops were scanty. Professor Rogers has furnished some figures on which he seems to base a general estimate of the yield of wheat in the first half of the fourteenth century, and as he lays great strength on this estimate in drawing his conclusions as to the total number of the people at that time, it will be well to consider these figures. Comparing the yield of wheat in the three years 1334, 1335, and 1336 with the seed sown in 1333, 1334, and 1335 respectively, he found that the return at Maldon was four times the seed, at Leatherhead less than three times, at Farley less than four times, at Cambridge about four times, at Gamlingay little more than twice, at Welford more than eight times, at Cuxham about six and a half times, at Holywell (probably the Holywell which now forms part of Oxford) nearly eight times, at Basingstoke about three times.² He states that the rate of seed to the acre was about the same as now, two bushels, so that these returns may be converted into bushels per acre by multiplying by two. So far as I have been able to ascertain, it is upon these data only that he comes to the conclusion that the farmer in those times generally got no more than eight bushels per acre and sometimes less. In his *Industrial and Commercial History of England*³ he states indeed that he has verified

¹ *Agriculture and Prices*, p. 540.

² *Ibid.* vol. i. pp. 50, 51.

³ P. 47.

his inference as to the average yield of wheat in cheap or abundant years a thousand times, and if that means that he has found corresponding results in a thousand instances instead of the few above quoted, then his general conclusion acquires a good deal of strength. But that that is his meaning is not quite clear, and it is at least worth while to note that in *Fleta*, a work said to have been written by a judge imprisoned in the Fleet about 1290, the average yield of wheat in England is ten to twelve bushels per acre.¹

4. Condition of Live Stock in the Middle Ages

No doubt the deficiency of winter feeding and the consequent loss of condition in the animals goes a long way to account for the enormous losses of stock which Professor Thorold Rogers notes as a great feature of medieval times. All deaths were grouped under murrain, and murrain is constantly recurring in the accounts of the farmers and bailiffs. In 1333 a farmer at Maldon reports the loss of more than half his sheep and lambs, at Leatherhead little less, at Farley one of 25 per cent, at Cheddington and Basingstoke more than 34 per cent, at Welford a little less than 14 per cent, and at Cuxham about 11 per cent.²

Such facts it is necessary to mention for no other reason than that the strength of England lay for so many centuries in its agriculture, but I may here venture to throw out the suggestion that the great ex-

¹ Garnier, *History of the English Landed Interest in England*, vol. i. p. 206, n.

² *Agriculture and Prices*, vol. i. pp. 53, 54. In this passage I have, on the strength of the data in the table on p. 46, substituted Cheddington for Welford, which by an evident slip is named twice in the passage above referred to.

port trade of England in early times, that in wool, may have been in part, perhaps in large part, due to a relative advantage which England enjoyed as long as the open-field system of agriculture prevailed both here and abroad. English wool has always been a highly valued commodity. Even in these days of agricultural depression and foreign competition and highly developed home manufactures, it still remains an important export from this kingdom.¹ Its value is due, I understand, to properties which make it peculiarly well adapted for certain branches of manufacture, particularly the "lustrous" worsted goods in which Bradford excels, and with the increase and slackening of the demand for which the prosperity of Bradford rises and falls. But this high excellence is quite a modern thing. It dates from the time when the rapid growth of commerce and manufactures combined, in the eighteenth century, to stimulate the development of scientific agriculture. Nevertheless in early times English wool had at least a relatively high value, and it had no rival in England as an article of export. In the Middle Ages, it was said, all the world was clothed in English wool woven in Flanders. This may be partly due to the fact that when the agriculture of the time afforded such scanty winter feeding, the peculiar mildness and moisture of the winter climate of England were more favourable than any other climate to the natural pastures to which

¹ Of course the export of English cannot now be distinguished from that of Irish and Scotch, but on the average of the five years 1896-1900, between twenty-three and twenty-four million lbs. of home-grown wool (average value more than £840,000) was annually exported, chiefly to the United States, but largely also to Germany and other countries of continental Europe. This quantity, it may be added, is much higher than the estimated quantity of English wool exported during the most flourishing period of the trade in the Middle Ages (see below, p. 347, n.).

the sheep were confined. It is at least worthy of note that in early times, as at present, English wools differed greatly in value according to the locality, but the differences were much greater then than now; and the wools of greatest value were those of the moister and milder western midland districts. Professor Rogers has rescued a very interesting document of the year 1454, in which a petition is made to the House of Commons that the wools of different districts of England should not be exported under certain stated prices. The petition was rejected, but that makes the document none the less valuable as showing the estimation in which the different wools were then held. At the head of the list, and that by a long way, comes Hereford "in Lemster" (that is, Leominster) at 260s. per sack; next come Lemster soke and Shropshire March at 185s. 4d.; then Cotiswold at 166s. 8d.; then there is another sudden fall to 113s. 4d. for High Lindsey, which is followed by ordinary Herefordshire wool, Young Cotiswold, and Low Lindsey, all at 106s. 8d. There are no other prices above 100s. and the prices descend to 50s. and 52s. for Sussex and Suffolk respectively. The Isle of Wight, another mild and moist part of England, was also esteemed for its wool. In this list it is priced only at 80s., but at the close of the sixteenth century it is reckoned by Camden¹ as the best after those of Lemster (Lemster ore, as he calls it) and Cotswold, and in *The New State of England*, by G. N. (1691),² it is placed even above these wools.

¹ *Britannia*, Gough's ed. (1789), vol. i. p. 123, col. 1.

² Garnier, *History of the English Landed Interest*.

5. Changes in the Condition of Labour due to the Black Death

According to Vinogradoff,¹ the whole system of open-field holdings began to break up in the thirteenth century, much earlier than in France or Germany. But this must apply chiefly to that part of the system which consisted in the rendering of labour services on the landlord's estate instead of money rents, for the open fields, with all their attendant disadvantages, continued to prevail, as already intimated, long after that date. The money rents that took the place of labour services were at first customary fixed payments,² and this change in itself would no doubt be favourable to an improved agriculture. In the fourteenth century, according to Professor Rogers, one effect of the great plague of 1348-49 and the consequent dearth and high wages of labour was to make landlords very willing to offer stock and land-leases (a kind of holding still met with in some parts of Scotland, where the farmer on this kind of lease is known as a boorer). The profits of agriculture at this time were so great that the lessees were soon able to purchase cattle or both cattle and land, and this kind of lease disappeared within fifty years.³ At the same time it must have considerably retarded the conversion of villains owing labour services into rent-paying tenants, inasmuch as it was obviously the interest of the lord of the manor to exact services wherever he could; and in many cases no

¹ *Villainage in England*, pp. 27, 28.

² One element determining the modern rent, namely differences in quality and situation, obviously could not exist, at least within the same village, as long as the open-field system was otherwise maintained. It was the final abandonment of that system that first made landowning a business on somewhat the same footing as any other commercial undertaking.

³ *Agriculture and Prices*, vol. i. p. 688.

commutation at all had been made at the date we are speaking of, while in others it was left to the choice of the lord whether to exact the labour or a money payment already agreed on as an equivalent. When free labourers were able to obtain so much higher wages than before for their services (in spite of legislative enactments directed to keep down the rate of wages) such exactions on the part of the lords of the manor must have been felt by the villains as a peculiar hardship, and they were undoubtedly among the leading causes of the peasants' revolt of 1381. A third important consequence of the great plague was a tendency to substitute sheep-rearing for arable farming, as requiring less labour.

6. Stationary Condition of Agriculture from the Thirteenth to the Sixteenth Century

In the practice of agriculture improvement continued during all this period to be very slow. Two works on husbandry that have come down to us, one (probably) from the thirteenth and one from the first half of the sixteenth century, enable us to gauge the progress made in that time. The former is Walter of Henley's *Book of Husbandry*, a work originally published in French, but afterwards translated into English and Latin, the translations belonging to the latter part of the fourteenth century. These translations seem to show that some advances were made since the original publication in the tending of live stock;¹ but even the later work referred to, Fitzherbert's *Husbandry* (1534), would appear to indicate that no material advance had been made in arable agriculture even in the fifteenth and part of the sixteenth century.² We may also note

¹ Cunningham, *Growth of English Industry and Commerce, Early and Middle Ages*, p. 492.

² Rogers, *Agriculture and Prices*, vol. iv. p. 44.

here that another work by the same writer, on Surveying (1539), gives evidence of the continuance of villainage services even at that date, for the author laments the institution as a disgrace to the country.¹

Even in garden cultivation, such as was quite compatible with the open-field system, England was behind the mainland of Europe. The Channel acted as a barrier to the spread of improvement. The common cabbage, the native nettle, and the onion seem to have been almost the only English vegetables, except perhaps in a few cloistered gardens, at a time when the French were familiar with three or four different kinds of cabbage, Brussels sprouts, spinach, sorrel, beetroot, carrots, turnips, lettuce, rhubarb, fennel, and other greens.² Even the leek does not seem to have been widely cultivated in England till after its introduction (probably an improved variety) from Switzerland in 1562;³ and it was not till about the middle of the same century that most of the vegetables above named came to be generally found in gardens. Queen Catherine of Aragon had to send to the Hague when she wanted a salad. The first entry of hops as cultivated in England (in the eastern counties) found by Thorold Rogers belongs to the year 1482.⁴ The best cultivation of all kinds was to be found in the lands of the clergy, who in the twelfth century owned half the cultivated lands of England, and could apply to their cultivation the knowledge which they gained from ancient agricultural writings.

¹ Cunningham, *ibid.* p. 360.

² Garnier, *History of the English Landed Interest, Early Period*, p. 274.

³ *Ibid.* p. 296.

⁴ *Agriculture and Prices*, vol. iii. p. 254.

7. First Great Period of Enclosing

But it was not till enclosed farms had to some extent taken the place of the open fields that any great improvements in the methods of arable agriculture took place in England. Not indeed till long after the beginning of this change, for the first enclosures were carried out with a wholly different aim. It has been said above that one of the effects of the Great Plague was to stimulate sheep rearing in place of arable farming. So greatly had the population suffered by this calamity that many townships were practically depopulated, and in these it would be an easy matter to find land for this industry without encroaching on the rights or needs of the surviving landholders. But sheep rearing continued to be the most profitable agricultural pursuit all through the fifteenth and sixteenth centuries, and as it extended land had to be taken from crops to be devoted to sheep. This was the cause of the first great era of enclosing, which accordingly appears to have led to a considerable depopulation of the country districts, and certainly to a very great depopulation of some country districts; and to the infliction of great hardships on numbers of the dispossessed arable farmers as well as labourers. The acts empowering these enclosures made no provision, it appears, for the maintenance of rights of customary tenants, from which it is inferred that at law they had no rights. But if they had not "rights" they had privileges sanctioned by the custom of centuries, on which they and their forefathers had depended for their living, and the withdrawal of those rights in favour of the new agriculture excited great discontent. The period during which these enclosures went on at a rapid rate is placed

by Ashley between 1470 and 1600 ;¹ but according to Cunningham they really began earlier, and went on all through the fifteenth century.² The period of 130 years, which Ashley assigns to it, is divided by him into two, one lasting from 1470 to 1530, when the enclosing was carried out by more violent and hasty methods, and the other from 1530 to 1600, when somewhat more regard was paid to the holders of small arable farms.

The results of this prolonged period of enclosing, according to Professor Ashley,³ were as follows :—

Suffolk, Essex (except the south-west), and Kent were almost entirely enclosed ; so also was about two-thirds of Herts (the south and middle) and of Worcestershire (all except the south-east), and about one-third of Warwickshire (in the west).

Northants, Shropshire, the southern half of Leicestershire, the east side of Norfolk (perhaps a fifth of the entire county), and probably the Isle of Wight were to a large extent enclosed.

Scattered enclosures had taken place in the remainder of Norfolk, and probably in South Beds and North Wilts.

On the other hand, the counties of York, Lincoln, Nottingham, Derby, Huntingdon, Cambridge, Buckingham, Middlesex, Berks, Gloucester, and Hereford were scarcely if at all disturbed.

In this statement it is interesting to note the lead still taken by two of the eastern counties, which we found (p. 276) to belong to the district which was by far the most populous in England at the time of Domesday.

¹ *Economic History*, vol. ii. p. 286.

² *Growth of English Industry and Commerce, Early and Middle Ages*, pp. 361, 362.

³ *Ibid.* pp. 287, 288.

8. Improvements in Agriculture since 1600

While the year 1600 may be set down as marking the end of the first great period of enclosures it is not to be understood that the practice then suddenly ceased. It did not entirely come to an end, according to Professor Ashley, till after the Restoration, and it was after that date that the county of Durham was almost entirely enclosed. About 1600, however, it gradually began to die out, owing to a change affecting the conditions of rural industry. Arable farming once more began to be more profitable than sheep farming, and it was this that led to the slackening of the rate of enclosing. All through the sixteenth century numerous editions of Fitzherbert's *Husbandry* had continued to be the sole printed guide to agriculture, but in the first half of the sixteenth century the revived interest in arable farming is borne witness to by the appearance of several works on the subject.

But the enclosures had changed the conditions of arable agriculture. They facilitated the introduction of new crops. One of the agricultural writers just referred to, Hartlib, author of the *Legacy of Husbandry* (3rd ed. 1655), states that gardening came into England about fifty years before. Old men in Surrey remembered when the first gardeners came there and began to plant cabbages, cauliflower, turnips, carrots, parsnips, early peas and rape—all introduced from Flanders and Holland.¹ The carrot about the same time was already common on sandy soils in Norfolk, Suffolk, and Essex. About the middle of the same century clover was introduced, also from Flanders, and

¹ Thorold Rogers, *Agriculture and Prices*, vol. v. p. 57.

got widely spread, especially in the midland counties of England, through the efforts of Andrew Yarranton, a man full of projects and energy, fired with an eager desire to improve his country in all ways, in emulation of the Dutch, and led by his zeal after improvement to travel not only into Holland and Flanders, but into more distant parts of Europe in search of discoveries that might benefit his countrymen. About the beginning of the eighteenth century the "artificial" grasses, sainfoin, and rye-grass were introduced, again from Holland;¹ and though the potato had long been known in Ireland it was only in the latter part of the same century that it came into general cultivation in England. To this later period also belong the introduction of the swede turnip, the field cabbage, mangold, kohl rabi, timothy grass, prickly comfrey, and spring wheat.²

The spread of these objects of agriculture after they were introduced was in many cases slow. It was in the eighteenth century, and especially in the latter half of it, that English agriculture, stimulated by the rapid rise of commerce and manufactures, began to undergo that rapid development which has at last placed it in some respects at least ahead of that of all other countries in the world. Down to the end of the third quarter of that century, the increasing population which commerce and manufactures helped to bring into existence, was fed entirely by native agriculture. Foreign competition was not dreaded. Even Adam Smith took no account of the possibility of this country becoming dependent on foreign supplies for any large part of its corn.³ Hence corn-

¹ Thorold Rogers in *Contemporary Review*, vol. xxxvii. p. 682.

² Garnier, *History of the Landed Interest in England, Modern Period*, p. 213.

³ "The small quantity of foreign corn imported, even in times of the greatest scarcity, may satisfy our farmers that they can have nothing to

growing, if practised with diligence and judgment, was one of the most remunerative of industries. If there was neither diligence nor judgment the remedy was easy. Clap a shilling or two per acre on the rent, was Arthur Young's favourite cure for bad farming. That would mend the farmer's laziness and sharpen his wits. But when such was the condition of the industry generally, there were many, both land-owners and farmers, who required no other stimulus than the tolerably sure hope of gain to devote themselves to it with energy.

9. Second Great Period of Enclosing

A great obstacle to the practice of improved methods consisted in the large area that still remained unenclosed. Down to the early part of the eighteenth century all the north and west parts even of the eastern tracts of Norfolk were still in the condition of sheep-walks let at as little as 6d. to 1s. 6d. or 2s. an acre.¹ In 1764 more than half the parishes of England were still unenclosed, but after that date enclosing went on rapidly. At the beginning of the reign of George III. the total number of Enclosure Acts was 244, at the end of it nearly 4000, and during the reign more than 1,250,000 acres were reclaimed from the waste.² In this statement we have already anticipated the period belonging to subsequent chapters, but it may be well to anticipate it still further and mention here that at last a general Enclosure Act was passed in 1845. It should be added too that these enclosures were not without their fear from the freest importation" (*The Wealth of Nations*, Book II. chap. ii.).

¹ Young, *Tour in the Eastern Counties*, vol. ii. p. 150.

² Garnier, *History of the Landed Interest in England, Modern Period*, pp. 208, 209.

attendant evils. The labouring man, it is universally admitted, was not always, if indeed ever, fairly treated in the arrangements under which the enclosures were effected. Under the Act of 1845 he was deprived of common rights over 320,855 acres, for which he was to be compensated by allotments; but a Royal Commission in 1868 showed that only 2119 acres were actually allotted.¹

But that improvements in the methods of agriculture went on rapidly in consequence of the enclosures is undoubted. The land was greatly improved by marling, a practice which is generally said to have been then revived. The probability is, however, that it had never died out. Camden mentions the burning of limestone for manure in the West Riding of Yorkshire in his time.² In the eighteenth century, however, the practice became general, owing to the stimulus which all kinds of industry then experienced, probably also owing to improvements in the means of communication. Manures of other kinds were increasingly used. Machine after machine was invented. At the date of Young's famous tours in England, about 1770, the average yield of wheat per acre had been raised to about 23 bushels.

10. Improvements in Live Stock in the Eighteenth Century

It was in the eighteenth century, too, that enormous improvements were made in the scientific breeding of live stock, especially sheep and cattle. With the ex-

¹ *Op. cit.* p. 511.

² It was burnt, he says, at Knottingley and Brotherton, and sent to Wakefield, Sandall, and Stourbridge, and so into the western parts of the county (*Britannia*, Gough's ed. (1789), chap. iii. p. 6, col. 1).

tension of enclosures the cultivation of the turnip and cabbage steadily spread over the country, thus affording the means of keeping large numbers of these animals in the same area. Scientific breeding could likewise be carried on without risk, and experience showed that it could be made at least as profitable as arable farming at the time. The great improvements both of sheep and cattle are principally due to Mr. Bakewell of Dishley, near Loughborough, in Leicestershire, a county still among those pre-eminent alike in sheep and cattle rearing, being characterised in its western half by broad vales belonging to the rich Keuper Red Marl forming admirable natural pastures. It is to him that we owe the improved Leicestershire and Lincolnshire breeds of sheep, which have principally contributed in modern times to make English wool famous for its softness, lustre, and length of staple, the qualities which make it peculiarly well adapted for "combing" and the manufacture of worsteds. The extent of the improvement may be judged of by the fact that the weight of improved Lincolnshire sheep is on an average from 8 to 9 lbs., and in many cases reaches 10, 12, or even 16 lbs.,¹ while in the fourteenth century the average weight of an English fleece appears to have been about 2 lbs.²

¹ F. H. Bowman, *Structure of Wool Fibre* (Manchester, 1885), pp. 87, 88.

² Thorold Rogers, *Agriculture and Prices*, vol. i. p. 53.

CHAPTER XVIII

MINING AND SMELTING—DOMESDAY TO 1800

1. Tin-mining

Few, probably, would question the fact that at the present day the geographical factor of most importance to the wealth and influence of England is the wealth of the country in coal and iron, and above all in coal. In a sense, that is, in the most literal material sense, that wealth has always existed, but it was only towards the close of the period now under consideration that the circumstances arose which gave value to that wealth.

As late even as the seventeenth century only two English minerals are mentioned of first-rate importance,—tin and lead. By this it is not to be understood that these were the minerals mined in largest quantity, or even those of most practical consequence to the daily needs of the people. But these were the minerals of greatest commercial value, or, we may say, in other words, those which attracted most attention by placing wealth in a few hands. They were thus those also which caused England to be looked upon as a mining country abroad.

The tin mines of Cornwall appear to have been little

Bohemia¹ were not discovered, so that Europe was dependent wholly on England for its supply of tin. Hence Richard obtained that enormous wealth which was the occasion of his barren election to the throne of Holy Roman Empire. Though diminished in value by the discoveries abroad just mentioned, the mines continued to be a source of wealth to the successors of Richard. Under a charter obtained by his son Edmund a tax was made payable to the earls on all the produce of the tin mines, and four towns, Liskeard, Lostwithiel, Truro, and Helston,² are fixed on as places where the tin should be weighed and stamped and the tax paid twice a year. When the earldom was made a duchy by Edward III. and the duchy attached in perpetuity to the eldest son of the King or Queen, these dues, including those on the Devonshire tin mines, went along with the duchy, and they continued to be levied till the beginning of the reign of Queen Victoria.

2. Lead and Copper mining

A writer of the early part of the seventeenth century³ speaks of lead as "the most merchantable commodity in England," and in a report which Sir Walter Raleigh addressed to James I. in 1603⁴ lead and tin, though not the only minerals mentioned as among the wealth of

¹ These mines, says Borlase (*Natural History of Cornwall*, p. 16), were discovered by a Cornishman disobliged by Earl Richard and driven out of his country.

² Bodmin formed a fifth in the time of Edward I., and Penzance formed a fifth from the time of Charles II.

³ J. Speed, *England and Wales*, 1615, under Somerset. (This seems to be a remark of Speed's own, though most of his work is rather unblushingly "conveyed" from Camden.)

⁴ See Anderson's *History of Commerce*, vol. ii. pp. 216-220.

England, are those to which most prominence is given. The principal lead-mining districts at that time were in Derbyshire, Somerset (Mendip Hills), and Swaledale and Wentsdale (Wensleydale) in Yorkshire—all localities where it was worked in the time of the Romans. The lead mines of Durham, now the most productive in the country, are not mentioned by Camden.¹ In 1691 Wirksworth, the centre of the Derbyshire lead-mining district, and one of the places mentioned for its lead-mining in Domesday, is spoken of in the *New State of England* by G. M. in 1691 as the biggest lead market in the kingdom.²

Next to tin and lead copper appears to have been the most important of English metals, at least as a commercial commodity. The mines of Cornwall and Devon, still the most important in the country, have been worked at least since the time of Queen Elizabeth, since which date the ores have regularly been brought to Swansea to be smelted, the ships taking back coal, at least in later times, for the smelting of the tin ores of the same districts. Mines were also worked in Richmondshire (N. Riding, Yorkshire) in Leland's time (middle of sixteenth century), at Wenlock in the time of Richard II, and in Borrowdale in Cumberland. These last mines are mentioned as early as the time of Henry III., and are stated by Camden to have been reopened in his time; but the works were destroyed in the civil wars of the time of Charles I., and the mines were never afterwards worked to any great extent.

3. Iron-mining

Iron must always have been mined in England to a greater or less extent, but it was late before its mining

¹ Latest edition of *Britannia*, published during the author's life, 1607.

² Garnier, *History of the English Landed Interest, Early Period*, p. 35.

and smelting came to be pursued on a large scale. The deficiency of iron in England nearly a century later is proved by an ordinance of 1354 prohibiting the export either of home-made or imported iron.¹ In the century after this ordinance there were legislative enactments with a view to encourage the industry. Henry VI. issued a charter for the introduction of miners from Bohemia, Hungary, Austria, and Misnia, and in 1483 Richard III. included among sundry other articles whose import was prohibited many made of iron.² In the essay of Sir Walter Raleigh, above quoted, iron is more than once mentioned as one of the products of England, but never in such a manner as to lead one to suppose that a surplus was produced. As late as 1740 the whole iron production of England was estimated at only 18,000 tons, and the import at the same date at about 20,000 tons. Even in 1796, after the introduction of spinning machinery, the whole iron production of England was only 125,000 tons.

For the greater part of the period now under review the production of iron depended not only on the local supply of ore but also on the abundance of wood so as to supply charcoal for smelting, for though coal was used in the later processes of the iron industry, it was not till about the middle of the eighteenth century that the method of rendering coal fit for use in smelting was generally known and practised. The chief districts noted for the iron industry accordingly were districts abounding in timber—the Weald of Sussex and Kent, the Forest of Dean, and the midland counties round Birmingham. Though carried on by the Romans the iron trade of the Weald is not mentioned in Domesday.

¹ Ludwig Beck, *Geschichte des Eisens*, p. 832.

² Beck, *ubi supra*.

The earliest known document relating to it belongs to the year 1266, a grant of Henry III. to the town of Lewes authorising a toll on iron.

In 1677 Yarranton speaks of most of the iron works of Sussex and Surrey as being laid down. In 1740 there were four furnaces in Kent, ten in Sussex; in 1788 two in Sussex, none in Kent; in 1796 only one in Sussex, that of Ashburnham, which was blown out in 1828. The Wealden ore most commonly used was a clay ironstone occurring in nodules and thin beds towards the bottom of the Wadhurst Clay (Hastings Beds). A bed of shelly calcareous ironstone a few feet above the Ashdown Sand was probably worked both for ore and flux. As the ore is still abundant it is manifest that the decline and ultimate stoppage of the works was due to the want of fuel arising from the destruction of the forests for the making of charcoal, and finally hastened by the introduction of cheaper methods of smelting in the coal-bearing districts.

An account of the other two chief iron-producing districts is given by Yarranton in 1677. In the Forest of Dean both ironstone and Roman cinders were worked, the Roman methods of treating the ore having been so wasteful and so far from thorough that it has been calculated that if the same methods were employed to-day the cost of a ton of iron would be upwards of £200. The metal derived from these ores and cinders is described by Yarranton as being "of a most gentle, pliable, soft nature, easily and quickly to be wrought into manufacture . . . and the best in the known world." He estimates the number of persons employed in its production and treatment at no less than 60,000. The metal made in Worcestershire, Shropshire, Staffordshire, Warwickshire, and Derbyshire, he states, is of a different sort, being

"a short, soft iron commonly called cold-shore iron," of which all the nails are made. The number of persons employed in the production and treatment of this iron he estimates at perhaps double the number of those employed in connection with the Forest of Dean iron.

Yarranton already expresses apprehension as to the decay of woods in this region, and with a view to the wants of the future he suggests that a law should be passed for inclosing all commons fit and apt to bear wood within twelve miles of the town of Stourbridge. In 1719, forty-two years later, a parliamentary report makes strong complaint of the devastation wrought by the iron works in the counties of Warwick, Stafford, Worcester, Hereford, Monmouth, Gloucester, and Salop. From those facts it might be inferred that the English iron industry may have been more vigorous in the latter part of the seventeenth than in the first half of the eighteenth century, and that the decline of the supplies of fuel appeared to be gradually extinguishing it.

4. The Use of Coke in Iron-smelting

The revival of the industry and its rapid subsequent development was due to the use of coal in smelting, which was first successfully achieved in the district just spoken of. Coal is usually stated to have been first successfully employed for the purpose by Dud Dudley, a natural son of Lord Dudley, in 1619. According to Thorold Rogers, however, there is evidence that the process was known a century before his time.¹ In any case the process seems to have remained a secret with those who employed it. The efforts of Dud Dudley to

¹ *Agriculture and Prices*, vol. v. p. 8, where, however, the evidence is not given.

carry on furnaces heated with this fuel were thwarted by the opposition of other iron-masters as well as the iron labourers. He died young, and the secret by which he achieved his success died with him. The method was rediscovered about a century later. From 1718 at the latest coked coal was regularly used in iron-smelting in the works of Abraham Darby at Coalbrookdale, but it was a good deal later before its use became general. The process long remained a Coalbrookdale secret, and as late as 1747 Malachy Postlethwayt, in a letter to a member of the House of Commons, urged a claim for a patent for the process for himself and his companions. It was only after that time that some of the most productive iron-fields of England and Wales acquired much importance, even though they may have been known in earlier times. Among these are the ironfields of Glamorganshire, which began to be developed on a large scale toward the end of the eighteenth century, and have again almost ceased to be worked on account of the refractory nature of the ore, and the mines of North Lancashire and Cumberland and of Lincolnshire. Mines in N. Lancashire (near Ulverston¹) and in Cumberland are said to have been famous as far back as the thirteenth and fourteenth centuries, but do not seem to have been of much importance when the mines of the south, south-west, and midlands were at their height. Lincolnshire iron-mines are mentioned in Domesday, but they seem to have had only a local importance. The development of trade and industry seems first to have extinguished, and afterwards revived them.

¹ Gough's ed. of Camden's *Britannia*, 1789, p. 143, col. 2; Thorold Rogers, *Agriculture and Prices*, vol. i. p. 145.

5. Coal-mining

The evidences of the use of coal in the early part of the period now dealt with are scanty, and not always clear. In old accounts coal, unless expressly distinguished as sea-coal, seems generally if not always to have meant charcoal, and hence is ambiguous. Still it seems to be pretty well established that coal was in use in Durham in the twelfth century. The first known mention of Newcastle coal is in a charter of Henry III. of the year 1234.¹ In the course of the same century a sea-trade to London in coal (hence called "sea-coal") grew rapidly, and it continued to grow in following centuries in spite of a royal proclamation in 1306 forbidding its use. The Halifax coalfield is mentioned in the Wakefield court-rolls in 1308; a coal mine at Cossall near Nottingham is mentioned in 1348, and in the course of the same century collieries are known to have been opened in Durham and Northumberland. Among the places at which its occurrence is mentioned by Leland (1549) are Walsall, the Cleve Hills, Wigan, and the valley of the Neath in Glamorganshire; and Camden (end of the same century) mentions it as an important product also at Cole Orton in Leicestershire and in the Frome valley in Gloucestershire. Hull believes that in the fourteenth century it was very probably extracted near the outcrop of the beds of most if not all the coal-fields of Great Britain and Ireland.² Still the total production was small, and its consumption apparently for the most part local. In 1660 the whole amount produced in England has been estimated at 2,148,000 tons, but the whole amount shipped at

¹ Anderson, *History of Commerce*, vol. i. p. 208.

² *Coalfields of Great Britain*, 4th ed., p. 25.

Newcastle (chiefly to London) in 1676 was estimated by Sir W. Petty at about 80,000 tons, and he speaks of the use of coal "in chambers" at that date as recent. In 1700 the total production of coal is estimated to have amounted to 2,612,000 tons; in 1750, 4,774,000 tons; in 1785, 6,889,000 tons; and in 1800, 10,080,000 tons; the figures for the last three dates mentioned showing the influence on the demand of its use in iron-smelting and latterly in steam engines.

6. Salt-mining

The salt springs of Worcestershire and Cheshire appear to have been worked more or less from the time of the Romans, timber being used as fuel in the refining furnaces. Leland speaks of the great destruction in the Fakenham forest as having already taken place in his time (1549) in consequence of the requirements of the springs of Droitwich. It formed the cargo of Bristol ships at least as early as 1375.¹ In Camden's time it was also made from sea-water near Seaton in Devonshire, and round the marshes on the Hants and Sussex coasts between Portsmouth and Chichester. Nevertheless Sir Walter Raleigh, in the address already more than once referred to, while making mention of the mighty store of salt in France and Spain, says nothing of that of England, and it was not till the eighteenth century that this commodity began to acquire the importance it has since retained in English commerce.

¹ A. S. Green, *Town Life in the Fifteenth Century*, vol. i. p. 89.

CHAPTER XIX

ENGLISH MANUFACTURES—DOMESDAY TO 1800

1. Difficulties in the Way of Developing Manufactures

WE have already seen in the chapter on Agriculture how much England owed to Flanders and Holland for the introduction of crops hitherto unknown in the country and improved methods of cultivation. In respect of manufactures our debt is as great if not greater. The embroideries of Winchester¹ are the only manufacture that we hear of as practised in England at the time of the Norman Conquest, but from the reign of William the Conqueror down to the end of the seventeenth century we are constantly told of manufactures or industrial processes introduced from abroad, foreign artisans being settled or welcomed in England, or foreign countries held up to us as models for imitation, and most commonly, always indeed in the earlier periods, it is the Low Countries from which the stimulus comes. When we consider the circumstances of England this is by no means surprising. Of course when we hear of a textile industry, such as the manufacture of linens or woollens, being introduced from abroad, we are not to understand that such industries were not previously

¹ See above, p. 230.

practised at all in England. It is to be taken for granted that linen and woollen garments of some kind were made throughout the country from the Roman period downwards, but the fabrics of home manufacture were only coarse stuffs made for local use in the agricultural villages. The textile manufactures introduced from abroad were those of the finer fabrics, or, as Adam Smith puts it, manufactures for distant sale. Now, such manufactures require, in order to thrive, a considerable market, and the larger the market the more flourishing and the more highly developed are they likely to become. But the home market of England was a small one.

Throughout the Middle Ages the population was scanty. A foreign market was therefore needed to give the necessary stimulus to the development of native manufactures. Not only that, but in order that commerce might stimulate manufactures, it was necessary that the industrial products of England should be able to compete in some way, whether in respect of quality or cheapness, with those produced elsewhere, and it was long before this condition was fulfilled. This accounts for the fact that we read of the same industry being introduced more than once from abroad, or being developed by the settlement of foreign artisans, for even when improved manufactures were once introduced, they were apt, in consequence of the inadequate market, to languish, or at least not to keep pace with the growth of those industries in countries more favourably situated. And of all countries few were more favourably situated in the Middle Ages and the early modern period than Flanders and Holland, with their seaports communicating with all the world, and their magnificent navigable rivers reaching into populous regions of France and Germany; and their vicinity to England made it natural

and almost inevitable that from them she should derive repeated stimuli to the growth of her own industry.

2. Early English Skill in Handicrafts

That there was any natural inaptitude for the practice of the arts among the English, the whole history of English industry when considered in the light of all the circumstances affecting it sufficiently disproves. Even in the earliest part of the period that we are now considering, the development of architecture in England, though directly due to a foreign stimulus, shows that among the English themselves there can have been no lack either of craftsmanship or artistic feeling. It is interesting, too, to find among the earliest of flourishing English industries that of bell-founding.¹ Undoubtedly the art must have been introduced from abroad, but it was natural that in England it should have attained to the condition of unrivalled excellence which it is said to have done before the close of the thirteenth century. The numerous churches and monasteries offered a sufficient demand for a manufacture of this kind, and in no other country were the raw materials of bell-metal, copper and tin, more abundant.

If other manufactures therefore were long in developing, we must seek for another explanation than want of skill, and the absence of a wide demand and a large internal trade is a sufficient explanation of the late growth of such manufactures as depended for their prosperity on the existence of a large market. Even brick-making, according to Professor Rogers, appears to have been little practised before the fifteenth century; at least he did not meet with any mention of bricks before

¹ William Denton, *Fifteenth Century*, pp. 52, 53.

that date. His earliest entry belongs to the year 1449, at Cambridge. Tile factories existed, however, before the close of the fourteenth century, as at Wye, a part of the estate of Battle Abbey, but no doubt the Wye in Kent, which is situated on a patch of brick-earth where the river Stour enters the Chalk. That brick-making, though extensively practised by the Romans in Britain, as in every other part of the world where they established themselves, was not carried on for centuries by the English, was obviously due to the fact that the abundant timber was a cheaper and more easily worked material, amply sufficient for such buildings as the small agricultural villages required. For a long time, says Professor Rogers, stone was cheaper than brick.¹ The best brick-layers, he conjectures, came from the Low Countries, where the art was early carried on, and where, it may be pointed out, the mode in which the surface has been formed has supplied a great abundance of the material for brick-making, while there was a lack of the building material used in timber-producing countries.

3. The Textile Industries

It is in connection with the textile industries that we hear most of the introduction of improvements from abroad, and the efforts of the government in one way or other to make English industry at least adequate to meet the home demand. Foreign artisans, when introduced, are generally settled in the eastern counties, the parts nearest to the European mainland, and in former times, as we have already seen, the most densely peopled. In 1080 William the Conqueror is said to have planted a colony of weavers from Flanders at

¹ *Agriculture and Prices*, vol. iv. p. 507.

Worstead¹ in Norfolk, a place frequently mentioned in subsequent centuries as a seat of the woollen industry, and which is said to have given name to worsted yarns and fabrics. In the beginning of the following century a large number of Flemings who had been deprived of their homes by an extensive inundation came over to England, under the favour of the queen-mother Matilda, daughter of Baldwin, Earl of Flanders, but these were ultimately settled by the king in the district known as Rhos or Ros in the west of Pembrokeshire. In 1155 the textile industry of the country was considerable enough for Nottingham to have acquired importance for its dyeing.² The linen manufacture is said to have been introduced from Flanders in 1253,³ and again in the fourteenth century, and the superiority of the foreign manufacture is shown in the fifteenth century by the mention of Holland linen (first met with by Professor Rogers in 1461) as a special quality; while even in 1677 Yarranton would have had us send to Dort in Holland for a man to put us in the way of ordering the fine threads, and to Harlem in Holland to whiten our tapes and threads, while to teach us the true way to make the tape he would have sent for a man from "Friburgh."⁴ The linen manufacture seems to have established itself chiefly in Lancashire. A colony of Flemings is said to have settled in Manchester as early as 1328,⁵ and another settled there in 1363. In the sixteenth century Lancashire cloth (linen) is frequently

¹ See, as to the former extent of this place, F. Seebohm in *Fortnightly Review* (original series), vol. ii. p. 157.

² A. S. Green, *Town Life in the Fifteenth Century*, vol. i. p. 326.

³ Cunningham, *Growth of English Industry and Commerce, Early and Middle Ages*, p. 285, n.

⁴ *England's Improvement by Sea and Land*, p. 159.

⁵ Leone Levi, *History of British Commerce*, p. 56.

mentioned, and, according to Professor Rogers,¹ it is on the whole the cheapest.

4. Growth of the Woollen Industry

The development of the woollen industry, that is, the working up at home of the chief home-grown raw material, was an object of solicitude to successive English Governments for several centuries. In 1258 the barons at the Oxford Parliament decreed that English wool should not be exported but should be manufactured at home. The decree was futile, and in the following century other methods were taken to promote the manufacture. In 1328 a patent was issued by Edward III. on behalf of the cloth-workers of Worstead in Norfolk. In 1331 the same king granted a letter of protection to John Kemp, a woollen cloth-weaver of Flanders, and offered similar protection to others, including dyers and fullers, in consequence of which seventy Walloon families came over to England. These were settled in Kent, mostly, it would seem, if not all, in the villages of Cranbrook, Tenterden, and Benenden,² and appear to have given rise to the manufacture of the broadcloth for which the county was long noted. Edward also issued a decree requiring all Englishmen to wear native cloth, and limiting the class who might wear fur. From this time, according to Anderson, the woollen industry of England has always flourished,³ and in fact we find references to the industry as practised in widely distant parts of the country before the end of the century. Among the places where it is pursued, it is interesting to find Kendal cloth mentioned

¹ *Agriculture and Prices*, vol. iv. p. 556.

² Camden.

³ *History of Commerce*, vol. i. p. 305.

as early as 1390 in an Act of the reign of Richard II. Other Acts of the same reign make mention of cloths of Somerset, Dorset, Bristol, Gloucester, and Guildford.¹ Professor Rogers has met with an entry of the carriage of a parcel of wool to Witney in 1385, which may, he thinks, possibly be taken as an indication of a woollen manufacture being already carried on at that place.² Early in the following century Coventry is noted for its woollen caps as well as other woollen manufactures.

But it was long before the woollen industry of England came to rival that of foreign countries. In the second half of the fourteenth century it had so far developed as to support a separate body of cloth finishers, who were also the general dealers in cloth, or drapers. The first certain evidence of such a body even in London, according to Professor Ashley,³ belongs to the year 1364. About this time there were three cloth fairs in suburbs of London—one at Westminster, the most important, lasting thirty days, the others at Smithfield and Southwark. In 1397 there is evidence of the existence of country drapers.⁴ We thus meet with a class of capitalists scattered through the country devoted to dealing in cloth, but it is only in the following century that we begin to find individuals employing their capital in the proper sense of the term in manufactures. Up to that time the manufacturers are merely individual artisans, working each on his own account and selling his product to the dealer.⁵

Further help for the English woollen industry was

¹ *History of Commerce*, vol. i. p. 383.

² *Agriculture and Prices*, vol. i. p. 576.

³ *The Woollen Industry*, in *English Economic History*, pp. 359] 64.

⁴ *Ibid.* pp. 361] 66.

⁵ Cunningham, *Growth of English Industry and Commerce, Early and Middle Ages*, p. 392.

sought abroad towards the close of the fifteenth century. Henry VII. is credited with a second foundation of their industry through his having in 1489 settled another body of Flemish weavers in various parts of England, but "particularly in Yorkshire, at Leeds, Wakefield, and Halifax, places well supplied with water, fuel, and cheap provisions."¹ This indicates that the migration of the woollen industry from the home and eastern counties, which were in earlier days the chief seats of the textile industries, to the northern dales had already begun to take place, and probably the chief reasons for the migration are indicated in the words just quoted from Anderson. The abundance of streams would be of importance both for the scouring of the wool and for the water-power which they afforded for the fulling-mills. The cheapness of provisions is the point that Anderson himself lays most stress on as causing this migration,² and no doubt it was of considerable importance. But it may be also pointed out that the new localities were within easy reach of abundant supplies of wool, including the wools of high quality furnished by the midland counties and the Lincolnshire Wolds.³ Professor Rogers, in considering this change of scene, attaches most weight to the superiority of the climate in the moister districts of England, a factor, he says, which would begin to tell when the manufacture was so far advanced that the quality of the wool and the manufactured product became a matter of importance.

Down even to the middle of the seventeenth century we still find the English woollen industry to some extent in a position of inferiority. In the paper by Sir

¹ Anderson, *History of Commerce*, vol. i. p. 526.

² *Ibid.* vol. i. p. 59.

³ See p. 296, where the high price of Lindsey (north Lincolnshire) wool is quoted.

Walter Raleigh of the year 1603, already quoted, it is urged that the English should learn to dye and dress their own woollens before exporting them,¹ and the finest English woollens were still dyed and dressed in Holland at least as late as 1654.²

In the eighteenth century the English woollen industry grew with a hitherto unparalleled rapidity. The great expansion may be dated from the time of the War of the Succession, when the English in alliance with the Dutch destroyed the power of the French at sea, and triumphed over their allies in the development of both their naval and mercantile marine. In 1712 the value of the woollen manufactures exported from England was estimated by Davenant in a report to the commissioners of accounts as making up more than £2,900,000 out of a total of nearly £6,800,000, or about 43 per cent. In *Considerations* laid before Parliament about the year 1739 the author estimates that more than a million and a half persons were then employed in the British woollen industry.

5. **Invention of Machinery**

We may note too that the stimulus now given at once to agriculture, commerce, and manufactures begins to show itself in English inventiveness applied to machinery. Lee's stocking-frame was indeed invented as far back as 1600, but it was long before this invention was followed up by others. The atmospheric steam-engine was contrived about 1705 by the joint efforts of Newcomin, Cawley, and Savery. The fly-shuttle, the simple but ingenious contrivance by which one loom was made to do almost the work of two, was patented by John Kay

¹ Anderson, *History of Commerce*, vol. ii. p. 219.

² *Ibid.* p. 429.

of Bolton in 1733. Five years afterwards a machine for spinning by means of rollers was invented by Wyatt of Birmingham. This invention fell dead at the time, but this method of spinning was revived by Arkwright and successfully introduced when he took out his patent in 1769. Previously to this the spinning-jenny of Hargreaves, the first machine by which more than two yarns could be spun at once, had been invented (1764), though it was not patented till 1770. Then followed the invention of Crompton's spinning-mule in 1779, and that of Cartwright's power-loom in 1785. The cardinal invention in the history of the steam-engine, Watt's separate condenser, belongs to the year 1769, but it was about the year 1785 when Watt's numerous other inventions had succeeded in rendering the steam-engine an efficient agent in textile as well as other industries, so that it began to come rapidly into use.

All these later inventions were applied, it is true, to cotton before wool, but in the end they served as a stimulus to all textile industries. Before setting down what it is necessary to say about the cotton manufacture, we will return to that of wool. This manufacture went on growing throughout the century, and in 1780 Anderson speaks of it as having long been "the glory of England and the envy of other nations."¹ This, however, is something of a patriotic exaggeration. The truth is, that the industry suffered not a little from the unwillingness of manufacturers to enter into free competition with foreign countries, and thereby secure the benefit of a healthy stimulus. They got the State to hedge them round with protective barriers,² and with the aid of these

¹ *Op. cit.* vol. i. p. 526.

² Among these may be mentioned the prohibition of the export of English wool maintained by law from 1660 to 1825.

were content to maintain their industry in a position of admitted inferiority to that of France.¹ Throughout the greater part of the century the finest woollen fabrics were imported from France into England; and it was only towards the close of the century, when the great English inventions began to tell so heavily on the industry generally, that the French markets began to be stocked with the products of English looms.

6. The Cotton Industry

The cotton industry of England was originally the result of the growth of English trade with India, a result, however, that did not come about till long after the foundation of the East India Company. Cotton was indeed known in England centuries before this. It is recorded as having been imported as early as 1298. As early as 1352, moreover, we hear of Manchester cottons, but for centuries after that the fabrics so called were either entirely woollen or mixtures of wool or linen with cotton. It was not indeed till after the inventions of spinning machinery in the latter part of the eighteenth century that a cotton yarn could be spun strong enough to serve as a warp in English looms. After this date the cotton industry, in the proper sense of the term, grew rapidly in several parts of the country; but it has gradually come to concentrate itself more and more in the district round Manchester, for three geographical reasons: first, the abundance and consequent cheapness of coal in the district; second, the peculiar dependence of the cotton (even more than the woollen) industry on a moist atmosphere, so that even the shelter of a hill against dry east winds is considered a matter of high pecuniary value,

¹ Leone Levi, *History of British Commerce*, p. 8.

and the presence of the Pennine Chain behind the south Lancashire coal-field to condense the moisture of the Atlantic winds is therefore of the highest consequence; and, third, the importance of being near a single great market for the raw material, enabling the spinners to select their yarns from a great variety of samples.

7. The Silk Industry

The silk industry has always been somewhat of an exotic in England. It may be that there are climatic reasons for this, as was suggested by Bishop Burnet in a conversation with Charles Davenant, in which he spoke also of the advantages of the English climate for the woollen industry. In hot climates, he says, silk is more disposed to imbibe the dye and take a more durable impression of it, the sun helping both to preserve it and give it lustre.¹ Whether this be true or not, it is in sunnier climates than that of England that the silk industry has mostly thriven. It was planted as a domestic industry by the Huguenots in Spitalfields, London, and umbrella silk is still manufactured there to a greater or less extent. In 1717 the first silk-mill in England (a water-mill) was established at Derby by a Mr. Lombe, on an Italian model. Since then the industry has been carried on mainly in that county, east Cheshire, and north Staffordshire, where streams of pure water abound. North Staffordshire is also fortunate in the possession, at Leek, of water which is reckoned to be among the best dyeing waters of Europe.

¹ Davenant, *Discourses on the Public Revenue*, etc., in Whitworth's edition of his works, vol. ii. pp. 235, 236.

8. The Iron Industry

Some account of the position of the iron industry during this period is given in the previous chapter. The geographical distribution of the working of iron on any considerable scale for the most part coincides with that of the smelting of the ore, but that is not wholly the case, and becomes less so as trade develops. The well-known allusion of Chaucer to the Sheffield whittle, which the miller of Trumpington (a long way from Sheffield, being close to Cambridge) bare in his hose, is evidence of the localisation of one branch of the industry in the fourteenth century. We have already seen, however, that Sheffield belongs to an old mining and smelting district. What contributed to make the town at an early date the special seat of cutlery was the occurrence of an excellent material for grind-stones in the neighbourhood,¹ as well as water-power at the town itself for the working of the tilt-hammers. But though Sheffield has continued to be noted for its cutlery ever since, the town long remained but a small one. In 1615 its whole population is given at 2207; in 1736 it was found by enumeration to be only 14,105.²

That iron should be worked at towns a short distance from but not actually within an iron-mining district is, of course, not surprising. Ross in Hereford, just north of the Forest of Dean, is mentioned as noted for its iron-works both by Camden at the end of the sixteenth century, and by his editor, Gough, towards the close of the eighteenth. If Ross was the *Ariconium* of the Romans, which is the general opinion, we may conjecture

¹ Now obtained at Wickersley, about eight miles east of Sheffield.

² Jos. Hunter, *Hallamshire*, new ed. by the Rev. Alf. Gatty (1869), pp. 21, 148.

that this was an industry handed down from Roman times.

The fact that coal was used for the working of iron at a time when it could not be used for the smelting of the ore was the cause of a considerable trade in iron as a raw material of manufacture. Camden mentions that the Somerset Frome flowed east from the Mendip Hills through pits of that kind of coal which the workers in iron find the fittest for the softening of that metal. Whether the coal was largely used locally for this purpose he does not say. No doubt it was so used to some extent, even though it does not seem to have given rise to any noteworthy iron industry in the locality; but one cannot help wondering whether the Romans, who used coal elsewhere in Britain, had already discovered this property of the coal found near Bath, and made use of it in their imperial factory.¹

As in other departments of industry, the notable improvements in connection with the working of iron seem all to have come from the Continent until the eighteenth century. Though the art of wire-drawing, and even the application of water-power in the art, was known in Germany before 1350, as late as 1565 all the wire made in England appears, according to Beck, to have been hammered. The first iron-mill in London was founded by a German, Gottfried Bex, in 1590.² The manufacture of tin-plate is said to have been a German invention, at least so far as the modern world is concerned,³ and from Saxony Yarranton endeavoured to introduce the art into England about 1665.⁴ At that

¹ See p. 229.

² Ludwig Beck, *Geschichte des Eisens*, p. 890.

³ Beck, *ibid.* p. 891, points out that, according to Theophrastus (*De Igne*, 71), the art must have been known even to the Athenians.

⁴ See the account in Smiles's *Industrial Biography* (ed. 1886), pp.

time Yarranton was engaged in carrying on iron-works; and knowing the excellence of some of the Forest of Dean iron for the tin-plater's industry, he considered that it would be of great advantage if the art were introduced into this country, which then imported large quantities of tin-plate from Saxony. He accordingly set out for that country, and there ascertained that the tin-mining and tin-plating district was situated near the border of Bohemia, in a "barren and mountainous country, which had thereby become exceeding rich and populous," the industry having been "the occasion of raising several brave cities," such as Annaberg, Marienberg, Schneeberg, and Awe. At this last town, of about 6000 inhabitants, standing at the base of the Erzgebirge, at the height of about 1150 feet on the Zwickauer Mulde, about 13 miles south-east of Zwickau, tin-mines had been discovered by a Protestant Cornish miner, who was banished from England in the reign of Queen Mary, and to whom Yarranton found a statue had been erected. Iron- and tin-working are still carried on at the town, where there is now a technical school in connection with the tin-plate industry. It is well worthy of note that Yarranton was well received by the tin-plate workers of this district, though this is by no means a solitary example of such courtesy being shown to would-be rivals, notwithstanding all that is alleged against the selfishness of trade. All the processes of the industry he wished to introduce into this country were shown to him and his companions, and he was even allowed to engage workmen to come with him to England. On his return the art was successfully practised for a time. Many

66-69, and in Yarranton's own work, above cited, Part II. (1681), pp. 150, 151, 157.

thousands of plates, far better than the German ones, were, he says, made from the tough and flexible Forest of Dean iron covered over with Cornish tin. But the rising industry was choked almost at its birth. Yarranton and his backers secured no patent for the industry, and this was obtained by some one else, who had heard something of the process but was unable to carry it out in practice. Hence it was not till 1720 that the industry was finally introduced into this country at Pontypool, in Monmouthshire, which, with the adjoining county of Glamorgan, has ever since remained the chief seat of the industry, the abundance of coal and iron and the long-established commercial relations of south Wales with Cornwall giving that region peculiar advantages for the manufacture.

A few years before, even the simple art of making cast-iron pots was unknown in England. Sundry experiments were made with this object by the first Abraham Darby of Coalbrookdale, the same who afterwards successfully introduced in his own works the smelting of iron with pit-coal; but these experiments were all failures, and it was not till 1706 that he ascertained by a visit to Holland that the whole art consisted in making the moulds of fine dry sand instead of clay, with which he had hitherto experimented.¹ The first notable English discovery connected with the working of iron appears to have been that of the method of making crucible (still the finest cast) steel, which is due to William Huntsman of Handsworth, near Sheffield, and was effected about the middle of the eighteenth century.

¹ Smiles, *Industrial Biography* (ed. 1886), p. 81.

CHAPTER XX

FOREIGN COMMERCE AND SHIPPING—DOMESDAY TO 1800

1. English Commerce in the Twelfth Century

THE paucity of records before the commencement of the great series of the Chancery Rolls in the reign of King John has made anything like an estimate of the extent and value of the foreign trade of this country in an earlier period impossible. Many isolated entries and notices of foreign commodities imported and native produce exported can, however, be gleaned from the Pipe Rolls¹ and the pages of monkish chroniclers; and from these notices we may gather that the surplus products of this country, consisting of lead and tin, wool and hides, and probably other animal products such as lard, etc., were more or less freely exported, whilst there was a more or less regular importation of such articles as wax, steel, silk, spices, mill-stones, etc., and a very considerable consumption of imported wine. As early as the reign of John some attempt was made to regulate this trade by way of tolls, levied at the outports and even on the great rivers. A large proportion of the foreign trade was in the hands of foreign merchants, who would appear to have sometimes obtained exceptional

¹ See Eyton, *Itinerary, etc., of Henry II.*

privileges, which were regarded by natives with a very intelligible disfavour.

2. Customs Duties

The natural desires of the English people were expressed in Magna Carta (1215), which declared trade to be free to all, native and foreign merchants alike. "*per antiquas et rectas consuetudines*," that is to say, on payment of the customary dues. But herein we see also a recognition of the necessities of the economic situation. It was no concern of the English barons to stipulate for privileges to foreigners. Their claim was essentially one for rights for Englishmen equal to those of foreigners, but they could not but recognise the fact that foreigners were essential to English trade. The more advanced civilisation of the foreigners, their greater wealth in money, their intimate relations with the markets in which English raw materials were in demand, all made foreigners indispensable. This fact was again and again taken advantage of by English kings to violate Magna Carta, in the interests of their own revenue, by granting special privileges to foreign merchants in return for loans or for other considerations.

The customary dues referred to in Magna Carta were probably those which by traditional usage the kings levied on wools, wool-fells, leather, and other commodities exported from or imported into the kingdom, a levy originally made in the form of a seizure of a certain proportion of those commodities for the needs of the Crown.¹ In 1275 a definite money value was given to these customs "in a more or less representative assembly." It was then enacted that the following rates

¹ Hall, *The Customs Revenue of England*, vol. i. pp. 56-66.

should be levied on exports: for a sack of wool containing 26 stones of 14 lbs. of 16 oz. each,¹ half a mark (6s. 8d.); for 300 fells or sheep-skins with the wool on, the same amount; and for a last of leather, containing 20 dickers of 12 hides each, one mark.² From the forty-second year of the reign of Edward III. (1368-69), 240 instead of 300 wool-fells were regarded as the equivalent of one sack of wool; but apart from that change these customs duties, known as the great or old customs, continued to be levied with little variation down to the time of the reconstruction of the fiscal system of England by the Long Parliament in 1640.

But besides those old customs there were other customs levied on minor articles by traditional usage, and for these also a definite money equivalent was fixed in 1303 under a treaty or bargain between the king and the alien merchants, who, at the same time, agreed to pay an additional half-mark on a sack of wool and its equivalent in wool-fells, as well as a poundage of 3d. on miscellaneous articles. These were known as the new customs, and the export articles on which they were levied were also staple commodities. These duties, both the new and old customs, were looked upon as fixed for all time, and as equivalents for old rights of the crown; but in addition Parliament from the year 1340 (?) continually granted subsidies on wool and other commodities for fixed periods and at varying rates, as well as with variable incidence (different rates being levied on natives and aliens), but generally at much higher rates than the old and new customs combined.

¹ Or 52 "cloves" or nails of 7 lbs. each.

² Hall, *ubi supra*, vol. ii. pp. 117, 118.

3. The Staple

For the levying of these dues officers were appointed at the ports, and, apparently with the view of controlling the trade more effectually, some place on the continent was fixed on as that to which all staple produce should first be sent. Edward III. seems to have entered on his reign with a disposition to grant greater freedom of trade. In 1328 a decree was issued declaring that all staples, whether on this side of or beyond the sea, were to cease. But this did not last long. The merchants themselves seem to have found it inconvenient; and when the wars of Edward made it necessary to raise a large revenue, the supervision of the customs on wool was made more stringent. A petition to Parliament in the seventeenth year of his reign (1343) shows that at that time there was an external staple at Bruges. In 1353 the staple was newly organised by a famous ordinance. In this ordinance Newcastle, York (with Hull as its outport), Lincoln (with Boston as its outport), Norwich (with Yarmouth as its outport), Westminster, Canterbury (with Sandwich as its port), Chichester, Winchester (with the port of Southampton), Exeter, and Bristol were named as staple towns for England, Carmarthen as that for Wales, and Dublin, Waterford, Cork, and Drogheda for Ireland. No foreign port was fixed on as a staple, but this arrangement was soon after altered, and some town beyond the sea was usually named as the sole place to which staple commodities should be sent. At first Bruges was the place selected, but in 1363 the staple was at Calais, and from the latter part of the reign of Richard II. Calais continued to retain the staple beyond the sea as long as the town remained in English hands (till 1558). But even when there was an external

staple the English ports for staple commodities continued to be fixed by law, and were hence sometimes spoken of as staple ports. It was at them that the duties were collected; and though a varying period of grace was allowed for the payment of the dues (both the regular customs, new and old, and the subsidy), all staple commodities had to be taken to the proper staple in England, and there weighed or measured and assessed by the "customers" or collectors of the royal revenue. The object of having an external staple appears to have been primarily to associate definitely the interests of the crown with those of a well-organised and privileged body of merchants, the Staplers, in the collection of the royal revenue, and afterwards to have an adequate revenue at hand to meet the expenses of the Calais garrison; for though the staple dues were paid in England, they were latterly assigned, sometimes wholly, to the Staplers at Calais, who were bound to account for them in various ways, but first by meeting the expenses referred to.¹ Indeed, it would appear that one of the chief net results of the Hundred Years' War with France was the maintenance of a "key to future conquests by uncrowned 'kings of France' reigning at Westminster,"² and thus to swallow up wealth derived from a natural English monopoly, which might otherwise have been available for the internal development of the country.

From the time when an external staple was fixed the general law was that all staple commodities should be sent thither and thither only, but to this there were some exceptions. Sometimes the northern ports, Newcastle and Berwick, are expressly excepted; sometimes Berwick only. It was thought, apparently, that if the

¹ See Hall, *ubi supra*, vol. i. pp. 86, 87, 116, 117, 283.

² *Ibid.* p. 117.

law were strictly enforced as regards these ports, the wool would be smuggled through Scotland in the hope of finding a better, because less restricted, market. Frequently, an exception was made in the case of exports from Hampton (Southampton) to the west, which in one ordinance is comprehensively explained as applying to all merchandise which "shall pass through the Straits of Morocco" (of course Gibraltar), but upon condition that what was known as "the Calais toll"¹ should be paid, that is, a small due levied as a licence for evading the Calais monopoly. For the Staplers a more serious evasion of their monopoly was due in many cases to special licences granted by the king to certain merchants to export elsewhere than to the staple. The motive which led to this evasion is on both sides obvious. When prices were run down to a low figure at Calais by the accumulation of immense quantities of wool there, merchants would readily enough pay to the king more than the equivalent of all the customs and subsidies put together for the privilege of being permitted to carry their wool to some port where it was more in demand.

In the ordinance of the staple of 1353 the only staple commodities expressly mentioned are wool, wool-fells, leather, and tin; but in a petition made by the men of Calais in the same reign (1376), and granted, there is a longer enumeration. The commodities mentioned are "wool, wool-fells, leather, lead, tin, worsted, cheese, butter, alum, tallow, etc." Here there is the notable exception of one manufactured article—worsted; but though there are other references to this as a staple, the raw materials above mentioned were always the important articles, and gradually these got

¹ Hall, *ubi supra*, vol. i. p. 286.

reduced, until in the reign of Henry VIII. the only staple commodities remaining were wool and wool-fells.¹

4. Aliens and Denizens in the Staple Trade

The rates of duty to be levied were those fixed for aliens by the agreement of 1303, and for natives or naturalised subjects those previously in force; as regards subsidies, those fixed by Parliament for the time-being. Accordingly, in violation of Magna Carta, there were different rates for subjects and aliens; but a still worse violation of that charter was found in a provision of the ordinance of the staple forbidding any but aliens to export staple commodities. A breach of the statute involved, by a subsequent Act, the penalty of life and limb,² though a later decree reduced the punishment to forfeiture of the goods exported by a denizen and his imprisonment for three years.³ The object manifestly was that the Crown should be able to levy the higher rate of duty agreed to by foreigners, and it shows how sharp was the need for money that had resulted from the king's wars with France. It is significant, too, of the circumstances of the time that at first these decrees appear to have roused very little outcry on the part of Englishmen.

5. The Hanseats and other Foreign Merchants in England

In all probability the majority of the foreign traders visiting England in the period preceding the institution of the staple came from the Low Countries, and in the early part of the thirteenth century these formed a

¹ Schanz, *Englische Handelspolitik gegen Ende des Mittelalters*, vol. i. p. 344.

² Hall, *ubi supra*, p. 221.

³ *Ibid.* p. 224.

league known as the Hanse of London, which at one time included all the towns of Flanders of any importance, besides several in northern France.¹ This league was, however, of much less importance than the Teutonic Hanse (confederacy), which, whatever its origin may have been (and of this different accounts are given), was already an extensive organisation about the middle of the thirteenth century, and gradually came to embrace all the leading mercantile towns of the German plains, including the northern Netherlands. Before the close of the thirteenth century this league gained a footing in London. German traders had already acquired a house in that city in the early part of that century on a site now occupied by Cannon Street station; and this house, known as the *Stahlhof* or "Court of Stalls,"² in English subsequently as the *Steelyard*,³ enlarged in 1243, became the house of this league, on which various privileges were conferred.⁴

Besides Netherlanders and Germans, Italians from an early date took an important part in conducting the foreign commerce of England. There is documentary evidence of Venetians in England as early as 1201. Florentines and Genoese were also conspicuous. Frenchmen also from Guienne and Gascony were naturally among the leading merchants in the wine trade, more

¹ Ashley, *Introduction to English Economic History*, Part I. vol. i. p. 109 (on authority of Warnkoenig, *Histoire de Flandre*, vol. ii. p. 207).

² In the sense in which we still speak of stalls at a bazaar, that is, places where goods intended for sale are laid out.

³ This translation is accordingly due to a misconception, "steel" being the equivalent of another German word "*Stahl*"; but the misconception was probably assisted by the fact that in the Middle Ages England was largely dependent on the continent, and consequently on the Hanseatic traders, for its supplies of iron and steel wares.

⁴ First under a royal charter granted by Edward I. in 1303, but not confirmed by Parliament till 1475 (Hall, *ubi supra*, vol. i. pp. 24, 27).

especially during the period when these provinces belonged to the English crown. From its nature the direct trade with Italy was comparatively small, the chief imports thence consisting in the most expensive luxuries; from Venice, for example, silks, baldachins of gold and silk, black damask and satin, etc.¹ But Italians did not limit themselves to the direct trade, as appears from the fact that the courts of the staple in cases in which foreigners were concerned were composed of two Englishmen, two Italians, and two Germans.²

The Hanseats, however, seem gradually to have acquired the leading place in the most important part of English trade in the early Middle Ages, namely the staple trade, as well as the trade with the Baltic and the North Sea, the seat of their power. At first their privileges in England were confined to the right of having a settlement in London along with certain rights of jurisdiction; but ultimately they acquired, and for a considerable time maintained, rights which more directly favoured them, to the prejudice even of native and still more of other alien merchants.

That the exclusion of Englishmen from the staple trade was not perpetual might be fairly inferred from what has just been stated as to the constitution of the court of the staple. Nevertheless, the prohibition of that trade to them was repeated as late as the fourteenth year of Richard II. (1390-91), the very period about which Keutgen writes. In later times, however, Englishmen certainly did take part in the staple trade, and even enjoyed greater privileges therein as compared with foreigners than those involved in the lighter customs

¹ Schanz, *ubi supra*, vol. i. p. 127.

² Keutgen, *Die Beziehungen der Hanse zu England im letzten Drittel des 14ten Jahrhunderts*, pp. 8, 9.

fixed in 1303. As time went on it became the practice to favour Englishmen at the expense of foreigners, in the rate of the subsidy to be paid. In many such enactments, however, the privileges of the Hanse were expressly reserved. According to Keutgen,¹ the customs privileges of the Hanse were no longer regarded in England after 1388, when a treaty was concluded with the plenipotentiaries of the Teutonic order, providing for liberty for English merchants to trade in Prussia (that is, practically, Danzig and Elbing); but if that was so, they appear to have existed, at least nominally, long after that date, for Schanz² mentions several instances in which lighter dues were leviable on Hanse than on native merchants a hundred years later (in the reign of Henry VII.); and the privileges of the Hanse were expressly reserved in an act as late as the twenty-second year of Henry VIII. (1530).³

6. The Merchant Adventurers

By this time, however, the power of the Hanse had waned, while native English commerce had been steadily growing, chiefly through the development of the company of Merchant Adventurers. The date of origin of this company is variously stated, the uncertainty arising largely from the fact that as long as the bulk of English export trade was in staple commodities, any merchants who traded in goods not belonging to the staple, and were accordingly unrestricted as to the destination they might choose for their wares, were known as "adventurers." When the company was fully organised it was disposed to place its origin as far back as "adventurers" were

¹ *Ubi supra*, p. 67.

² *Ubi supra*, vol. ii. p. 6.

³ Hubert Hall, *ubi supra*, vol. i. p. 291.

known in English trade. In a petition for the repeal of a statute of Henry VII.'s reign the Merchant Adventurers date their origin from 1216. John Wheeler, whose *Treatise of Commerce*, published at Middelburgh in 1601, is the chief authority for the history of the company, gives 1248 as the date of its foundation, on the ground that in that year the Brotherhood of Thomas Becket obtained from the Duke of Brabant certain privileges which were confirmed by the King of England. Schanz, from whom these facts are taken,¹ says that it is certain that some time in the thirteenth century certain privileges were granted to Englishmen, but that these privileges probably embraced all Englishmen, though afterwards claimed by the Merchant Adventurers for themselves solely. Further privileges followed in the fourteenth century, but these did not of themselves suffice to create a separate organisation. During the whole of that century the centre of English trade with the Low Countries was at Bruges in Flanders, and the vicinity of this town to Calais facilitated the regulation of the entire English trade by the merchants of the staple. But in 1404² a charter was granted by Henry IV. to the company, which shortly after acquired a house at Antwerp in Brabant. From this time forth, accordingly, there was a strong antagonism between the Merchant Adventurers and the Merchants of the Staple, and, as the staple trade was largely in the hands of the Hanseats, between these also and the Adventurers.

¹ *Ubi supra*, vol. i. p. 336.

² For this date, earlier than that usually given, I am indebted to a private communication from Mr. Hubert Hall, who found an entry of the charter dated June in the Patent Roll of 5 Henry IV. A second patent was granted in 1407.

7. Trade with Scandinavia and Iceland

Meantime the trade of "adventurers" had acquired importance in two other regions—in the northern countries and in Portugal. The Scandinavian states were related to England in much the same way as England was related to the Low Countries. They lacked, in a much higher degree than England, an extensive independent manufacturing industry, but, like England, possessed a great wealth of raw materials. From them England obtained fish, train-oil, blubber, timber, and timber-products (tar, pitch, ashes, and resin), and furnished in exchange grain, honey, flour, liquors, besides industrial products of all sorts.¹ The successful introduction of Christianity into Denmark had followed the conquest of England by Cnut, and had taken place about the same time in Norway. English trade and influence came with it, and, according to Schanz, before the thirteenth century the English were probably the most numerous of all foreigners in the Scandinavian north. Before the close of that century, however, they began to have rivals in the Germans, and as the Hanse grew in power the struggle became keener, till in 1370 predominance was secured by the Hanse, whose factory at Bergen was for some time after the chief seat of trade with Norway.² The Hanse merchants seem to have reserved for themselves the herring fisheries carried on from about the end of July to the end of September off the coast of Scania (Schonen) in the south-west of the present Sweden, although English merchants, more or less at their own risk, visited these seas to take part in the salting of the fish and in trade.³ Balked in these waters, English merchants sought

¹ Schanz, *ubi supra*, p. 247.

² *Ibid.* p. 249.

³ Keutgen, *ubi supra*, pp. 53, 54.

compensation in the trade with Iceland. But the freedom of trade which had been granted by Norwegian kings to England did not extend to this Norwegian colony. The trade was accordingly a smuggling one. Scarborough seems to have been the first to enter on it, but other ports followed—above all, Bristol. Till the time of Henry V. the smuggling was virtually countenanced by English kings, but from his time onwards it was repeatedly prohibited, so that the English engaged in the trade had to buy two expensive licences, one from their own king and one from the king of Norway. The trade, however, was sufficiently profitable to be continued. It was through it that the Canynges,¹ whose benefactions to Bristol have come down to our own day, acquired their great wealth.

8. Trade with Portugal

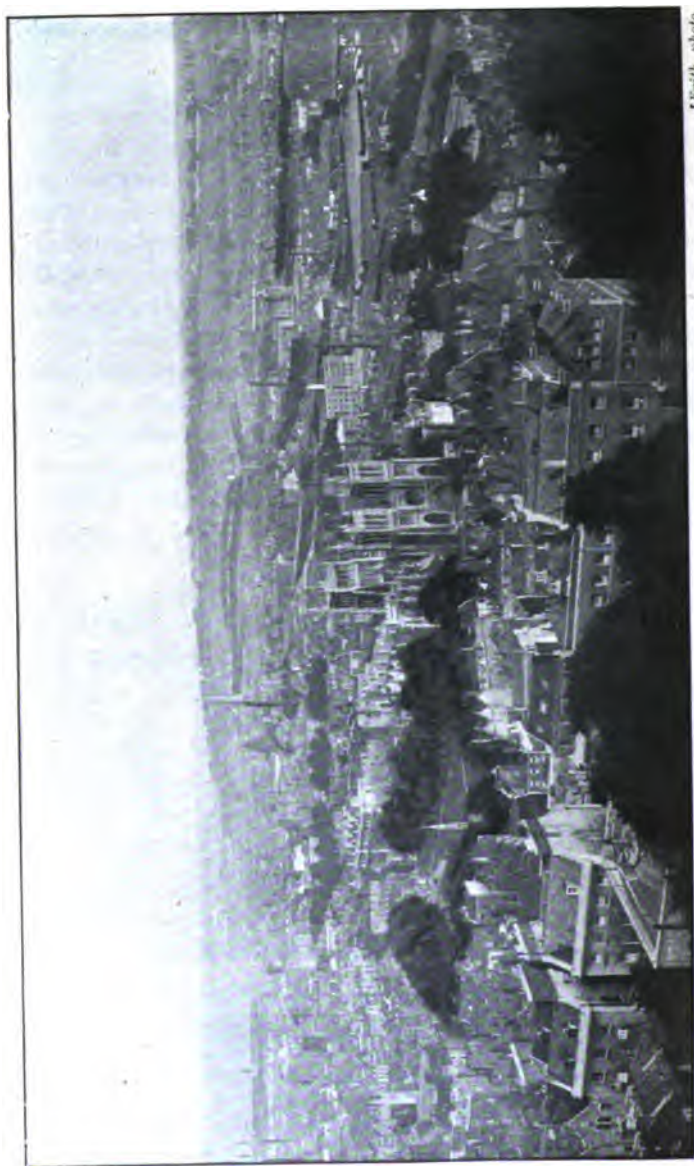
In Portugal, King John granted to the English in 1400 all the commercial privileges then enjoyed by the Genoese, at that time the most favoured people. Further favours were persistently sought for, however, and at last the Portuguese king granted nearly all the demands set forth by the English in a petition drawn up in 1458, a grant which became of great importance after the discovery of the sea-way to India, and which was confirmed even towards the end of the sixteenth century.²

9. Decline of the Hanse and the Staple

The struggle between the adventurers and the Hanseats, of which that between the special organisation

¹ The younger William Canynges, grandson of the first-known Bristol merchant of that name, died in 1474.

² Schanz, *ubi supra*, vol. i. p. 286. See also C. R. Beazley, *Prince Henry the Navigator*, p. 135.



Levin, photo.

BRISTOL.

known as the Merchant Adventurers and the Staplers was in some sense a part, went on throughout the fifteenth century. The agreement of 1388, already mentioned (p. 342), conceded the right of the English to trade in the eastern parts of the Baltic belonging to the Hanse, but force had often to be used to make good these rights. But already the power of the Hanse was beginning to decline. In 1397 the union of Kalmar placed the crown of Denmark, Norway, and Sweden on one head, and that power was thus strong enough to occupy a position of greater independence as against the league.

This, however, did not diminish the importance of the Hanse merchants in the staple trades of England; but as raw wool was the most important article in this trade, so woollen manufactures were the most important in that which was conducted by the Merchant Adventurers. The fortunes of that society thus rose with the woollen industry, and hence were greatly promoted when the kings of England sought to encourage manufactures at the expense of the trade in raw wool. (See above, p. 322.) In 1354 the amount of raw wool exported amounted to more than 30,000 sacks, each of 364 lbs.¹ After the thirteenth and fourteenth year of Henry VIII. (1529-30) it never exceeded 10,000 sacks, and was generally to the end of his reign (1553) under 5000, frequently less than 4000 sacks.² The inference is that at the latter date most of the English wool was manufactured at home, and woollen manufactures had taken the place of the raw commodity among the exports.

¹ The whole production of wool in England at this time appears to have been at the most about 50,000 sacks or about 18,000,000 lbs. (Schanz, *ubi supra*, vol. ii. p. 15, n.).

² Schanz, vol. ii. p. 84.

As the Merchant Adventurers consequently grew in power, they endeavoured to form themselves virtually into a close gild, but this design was thwarted by the Act of 12 Henry VII. c. 6 (1496-97), providing that any Englishman should be allowed to trade to the Netherlands on payment to the company of an entrance fee of ten marks (£6 : 13 : 4). Otherwise Henry VII. favoured the company. In 1501 he confirmed its charter, and drew up for it a new organisation, based largely on the model of the staple. In 1505 he finally secured its victory over the staple by an act declaring that members of one company must bear the burdens of another company if they mixed themselves up in the trade of the other company, thus enabling the Merchant Adventurers to make good their claim for payment of the entrance fee to their company of those staplers who came to Antwerp to carry on trade in non-staple commodities. The Hanse merchants continued to hold an important place in the staple trade till the reign of Elizabeth, but in 1598 they were deprived of all privileges and the Steelyard was closed.

10. The Chartered Companies of the Sixteenth and following Centuries

Long after the date just mentioned, the Merchant Adventurers continued to be an important body. A regular charter of incorporation was conferred upon them in 1564, and in the latter part of the sixteenth as well as in the seventeenth century they even formed "a potent factor in national politics."¹ The company was

¹ See a paper by W. E. Lingelbach, A.B., on "The Organisation and Government of the Merchants Adventurers of England in the Sixteenth and Seventeenth Centuries," in *Trans. Royal Histor. Soc.* vol. xvi. U.S. (for the sight of a proof of which I am indebted to the courtesy of the editor).

what was known as a regulated company, the members of which traded each on his own capital, but were all bound by rules and restrictions framed by the governing body. In the case of the Merchant Adventurers, although membership was in the strictest manner confined to Englishmen, this governing body had its seat abroad—at Antwerp or, latterly, at Hamburg, on which account it was known in its later days as the *Hamburg Company*. The sphere of its operations abroad was the eastern shores of the North Sea as far as the entrance to the Baltic. Other similarly regulated companies operated elsewhere. The *Muscovy Company*, on which charters were conferred in 1553, 1566, and 1697, operated in Russia and the countries adjacent to the Caspian Sea. The *Eastland Company*, under charters conferred in 1579, 1629, and 1672, had privileges in connection with trade with Scandinavia and the Baltic. The *Levant*, afterwards known as the *Turkey Company*, had similar privileges in the Mediterranean and more especially the Levant trade, under charters granted in 1605, 1644, and 1752. Trade with West Africa was carried on by the *Africa or Guinea Company* under charters of the years 1662, 1672, and 1750. Special interest attaches to the *East India Company*, which was founded under a charter dated the 31st December 1600, and at first carried on its trade with the East as a regulated company. The first twelve voyages are known as the separate voyages, but afterwards the company traded on a joint-stock. But the important feature of the foreign trade of this time was that all these companies, whether regulated or joint-stock, aimed at securing a practical monopoly of the trade in the regions in which they operated. In some cases the monopoly was expressly conferred by the charter, in other cases it was not. All, however, had to battle with the

encroachments of outsiders, or, as the companies termed them, "interlopers." At last in 1689 the Declaration of Rights abolished by implication all monopolistic rights in foreign trade conferred by the crown, and from that time onwards the encroachments by interlopers in the domains that the companies endeavoured to reserve for themselves became more and more frequent and extensive. In the Eastern trade, however, a monopoly was granted by Parliament when the East India Company was re-constituted in 1709. This was maintained to a date beyond the end of the period now dealt with, but it may here be mentioned that the monopoly of the Company in the Indian trade was abolished in 1813, and that in the China trade in 1833.

11. English Shipping

English shipping meanwhile had also been developing. The attempt made by Richard II. to render it independent of that of foreign countries by the first Navigation Act had indeed failed, but already in that reign there were British merchant-vessels of considerable burden. The second William Canynges of Bristol then had vessels of 400, 500, and 900 tons. Another Navigation Act was tried in 1489 by Henry VII., and this time with more effect. In that reign the bulk of the foreign trade of England appears to have been carried on by English shippers.¹ To this reign belong the memorable voyages of the Cabots from Bristol, by which Newfoundland and Labrador were discovered (1497-99), and more southerly parts of the coast of North America explored. In 1531 the Navigation Act of Henry VII. was renewed by Henry

¹ A. S. Green, *English Town Life in the Fifteenth Century*, vol. i. pp. 94, 122.

VIII. English mercantile shipping appears to have gone back in that reign, and there were no great achievements of English shipping till after his death.

The first year of the reign of his successor, Edward VI. (1553) was, however, signalised by the first great English maritime adventure since the voyages of the Cabots. The object of these voyages had been to find a north-west route to India through seas not frequented by the Spaniards. Sebastian Cabot lived to recommend to the Merchant Adventurers the search for a north-east passage, and in the year mentioned an expedition under Willoughby and Chancellor set out with that object in view. Willoughby and his crews perished, but Chancellor discovered the route to the White Sea. It was this discovery that led immediately to the establishment of the Muscovy Company mentioned in the previous section. Still later the search for the north-west route was again taken up by Frobisher (1576-78), Davis (1585-87), Hudson in 1609-10 (in Dutch service), and Bylot and Baffin in 1615-16. In 1577-79 Francis Drake made his famous voyage round the world. With these voyages the glory of English seamanship may be said to begin. They were all accomplished, however, in small vessels. In 1572 the largest English vessel is said to have been of only 240 tons burden. In the first voyage of the East India Company (1601-03) the largest vessel was one of 600 tons manned by 200 men. Not till long after the Navigation Act of Cromwell (1651), the most stringent and the most rigorously enforced of all the Navigation Acts, did English shipping rise to pre-eminence. But the further course of English history at sea will be more conveniently considered in the next chapter.

CHAPTER XXI

POLITICAL SITUATION—DOMESDAY TO 1800

1. The relations of England with Scotland and the Continent — The Defence of the Southern Coasts — The Cinque Ports

IN the previous chapter the salient facts of the development of English commerce and shipping are merely mentioned. The causes of that development are so intimately bound up with the development of English power, that the two cannot be treated separately. At all times English power has depended on the command of the sea. English armies have gained renown by their victories many times and in many places, but to secure conquests the steady maintenance of power at sea has been a necessity. On the other hand, her insular position, except for a time on the Welsh and Scottish borders, has always been an enormous advantage to her in maintaining a merely defensive position. For more than five centuries after the Conquest the break in the insularity of the north was a continual embarrassment, especially in periods when England was embroiled with continental enemies.

The security of England against continental invasion was increased for nearly a hundred and forty years after

the Conquest, by the retention of Normandy in the hands of the Norman conquerors. The raids of the Norwegians and Danes, with a view to the seizure of lands of which they forcibly dispossessed the previous owners, had ceased when they became converted to Christianity. The eastern and northern coasts of England were thus unharassed, and the chief sea-power of England lay in early Norman times in the south. The responsibility of defending the kingdom against attack by sea was laid upon the Cinque Ports—Hastings, Sandwich, Dover, Romney, and Hythe, to which were added soon after the Conquest the two "ancient towns" of Winchelsea and Rye. On these at very early date various privileges were conferred as an equivalent for the burden imposed on them. But the lightness of their task, as long as the English connection with Normandy lasted, caused them to be inconspicuous in English history at that time, notwithstanding the importance that their privileges implied. They were chiefly engaged in carrying on a peaceful commerce with the opposite shores of the channel.

The position was altered in 1204, when Normandy was taken from King John by Philip Augustus, and again and again after this event we find the sea exercising a decisive influence on English history. In the first place, we may note that on this occasion the sea placed a natural and effective barrier to any further aggression on the part of the French king. In the latter part of King John's reign, however, when England was divided against itself, Louis of France, the son and successor of Philip Augustus, accepting from the revolted barons the offer of the English crown, was able to land a force in Kent, but when the death of King John (1216) had changed the situation, the danger thereby created was promptly averted by the action of the Cinque Ports. Hubert de

Burgh, sailing out from Dover at the head of a comparatively small fleet, completely defeated a much larger French fleet which, under the command of the pirate Eustace the Monk, was conveying supplies and reinforcements to Louis, who thereupon consented to withdraw from England. It was only with the aid of a fleet furnished by the Cinque Ports that Edward I. was enabled to complete the subjugation of Wales in 1282. Before that time the mountainous angle in the north-west protected by the island of Anglesey had always baffled the English invaders, but when the Cinque Ports enabled Edward to bring an effective force to bear upon that part of the principality also, Llewellyn, the last Welsh prince, was forced to surrender.¹ With the same aid Edward hoped to achieve the final reduction of Scotland, but his death at Burgh-upon-Sands, on the borders of the firth appointed for the meeting of fleet and army, frustrated the enterprise (1307).

2. The Sea-power of England from the Thirteenth to the Sixteenth Century

The power of England at sea was, however, only fitfully asserted and established by the stronger kings. The maintenance of that power was one of the distinct aims of the policy of the first Edward. It was he who conferred on the Cinque Ports their first comprehensive charter (1278), and towards the close of his reign he expressly claimed for England the sovereignty of the Narrow Seas. But the Cinque Ports, important as they were by their situation, were far from adequate for the establishment of such a power. Even before those changes of the coast-line which deprived most of them

¹ Montague Burrows, *Cinque Ports*, p. 116.

of nearly all their value as seaports, their harbours were so shallow as to admit only vessels of very light draught. It seems to be doubtful whether any of the ships furnished by these ports when in their prime in the century of which we are now speaking, was more than fifty tons, and the normal burden of the ships at Hastings, which then stood at the head of the confederacy, appears to have been about twenty tons. The total complement of the crews carried by the fifty-seven ships which the ports were jointly required to furnish was only 1368 men.¹ Hence, when larger ships were required they were obtained at other ports. The ships in which the crusading army of Richard I. with its baggage was conveyed to the Mediterranean, a hundred years before Edward I., were furnished by the south and west of England and by the ports of Anjou; and after the thirteenth century, when larger vessels came to be regularly required for a strong navy, the Cinque Ports, though still retaining the precedence which their privileges of old date secured for them, sank to a position of relative insignificance in the fighting force which they actually supplied.

Edward III. was the next king to assert the power of the English at sea, but he did so with success only in the first half of his reign. From 1360 onwards several descents were made by the French on the English coasts. Winchelsea was thrice sacked between 1360 and 1380. In 1372 the destruction of an English convoy by a Spanish fleet off La Rochelle showed the impossibility of maintaining conquests abroad without ensuring the continued command of the sea, for, two years later, the whole of Guienne and Gascony, with the exception of the ports of Bordeaux and Bayonne, were lost. And this loss accelerated the decline of the English navy by

¹ *Op. cit.* p. 88.

diminishing the commerce in English ships with that part of France, and hence reducing the supply of English seamen, a circumstance which, as Mahan insists, is bound to tell in a long naval war.¹ Nevertheless even then the importance of England's natural defence was illustrated by the complete frustration of an attempt of the French to invade England on a large scale in 1385.

The disastrous designs of Henry V. again necessitated the paying of attention to the navy; and by this time importance was attached to the size of the vessels. Three large ships were built by him in imitation of those of the Genoese. But this was only a transient spurt. During the greater part of the fifteenth and sixteenth centuries the naval force of England was of little account, though there was more than one indication of the sense of the value of that force. During the minority, and subsequently under the weak reign of Henry VI., the navy of England was never in such a condition as to keep the army holding the conquests of his father in France properly reinforced and equipped; and hence all the military skill of the English leaders and the valour of the troops were thrown away in the attempt to retain those conquests. Among the occasional signs of a sense of the importance of maritime strength may be mentioned the establishment of the arsenal of Deptford by Henry VIII., the building by the same king of the large man-of-war, the *Henry Grace de Dieu*,² and the enactment of the Parliament of 1548, with a view to the increased consumption of fish, and consequent promotion of the fisheries as a nursery for seamen.

¹ A. T. Mahan, *Influence of Sea Power on History*, vol. i. p. 66.

² A two-decker of 1000 tons displacement, carrying fifty-four eighteen- and nine-pounder guns in the batteries, and twenty-six smaller pieces on the upper deck and elsewhere, and having a complement of 700 men.

3. Growth of the Maritime Importance of England in the Sixteenth and Seventeenth Centuries—Rivalry with the Dutch.

The continuous growth of the maritime influence of England may be dated from the close of the sixteenth century, when the enterprise and audacity of Drake, Frobisher, Hawkins and other adventurous spirits perfected the seamanship which enabled England to vanquish the Armada (1588). This colossal attempt at invasion no doubt did more than anything else to awaken the sense of the paramount importance for England of maritime strength. At any rate, the fact was never more clearly recognised or more fully expressed, though indeed it has been more copiously illustrated, than in the words of Bacon, first published early in the following century:¹ "To be master of the sea is an abridgment of a monarchy. . . . Thus much is certain, that he that commands the sea is at great liberty, and may take as much and as little of the war as he will. Whereas those that be strongest by land are many times, nevertheless, in great straits. Surely at this day, with us of Europe, the vantage of strength at sea (which is one of the principal dowries of this kingdom of Great Britain) is great; both because most of the kingdoms of Europe are not merely inland, but girt with the sea most parts of their compass, and because the wealth of both Indies seems in great part but an accessory to the command of the seas."

The advantage of being able to "take as little of the war" as the country liked was well illustrated in the first half of the seventeenth century. The disorders abroad from which England—now united under one crown with Scotland—was able, in virtue of her insular

¹ *Essays*, No. 29, "Of the True Greatness of Kingdoms and Estates."

position, to keep herself free helped to develop English industries. Though the non-combatants in the Thirty Years' War (1618-1648) were, says Thorold Rogers, half extirpated, the soldiers had to be clothed and fed,¹ and this partly accrued to the profit of England. The losses in the English civil war (a comparatively short one, it must be remembered) were, according to the same authority, in no slight degree compensated by the rapid development of English commerce.²

When that war ended in the establishment of the strong government of the Protectorate, attention was again given to the English navy, which had so often been felt to be essential to English strength. Then was equipped that navy "organised by Vane and wielded by Blake," with which, in the words of Sir J. Seeley, our maritime ascendancy began. The necessity of commercial shipping to the maintenance of naval strength was no less clearly felt, and this led to the passing of the most stringent and most rigorously enforced of all the navigation Acts (1651). From the circumstances of the time this Act was chiefly directed against the Dutch, and it speedily led to a war (1652-54) with that people, which showed them how precarious their prosperity was, when they are brought into conflict with a people able to contend with them for the mastery of the seas. In this war the very prosperity of the Dutch in the past was a disadvantage to them, the comparative backwardness of England an advantage to her. The wealth of the Dutch, based almost entirely on manufactures and commerce, had created a population largely dependent on supplies from abroad. England, on the other hand, was still mainly self-dependent, and had to look abroad only for the

¹ *Agriculture and Prices*, vol. v. p. 797.

² *Ibid.* p. 142.

superfluities of life, and could thus face the chances of naval warfare with less risk of disaster. When the war had lasted eighteen months "shipping business was stopt and, it is said, 'the sources of revenue which had always maintained the riches of the State, such as fisheries and commerce, were almost dry. The Zuider Zee became a forest of masts; the country was full of beggars; grass grew in the streets, and in Amsterdam fifteen hundred houses were untenanted.' A humiliating peace alone saved them [the Dutch] from ruin."¹

Throughout the century England preserved the advantage of having less to lose, if not more to gain by war than the Dutch, and was only too ready to strive for supremacy in that way. The English feeling on this head is clearly enough indicated by the speech attributed to Monk at the outbreak of the war that lasted from 1665 to 1674, "What matters this or that reason? What we want is more of the trade which the Dutch now have."² The incidents of the war were in some cases humiliating, in one instance humiliating to the last degree. But misfortunes and humiliation did not even threaten England with ruin, as Holland had been threatened in the short war of 1652-54. At the conclusion of peace, the true basis of England's power at sea was steadily growing.

4. The Situation at the Time of the War of the Spanish Succession—The Methuen Treaty

This virtual victory of England over Holland changed the attitude of the English mind towards that country,

¹ Quoted in Mahan, *Influence of Sea Power on History*, vol. i. p. 38, from an author not named.

² Mahan, *Influence of Sea Power on History*, vol. i. p. 107.

and on the accession of William III. disposed the people to join Holland against France, which since the revocation of the edict of Nantes in 1685 was the avowed enemy of the Protestant religion, and war was declared by both on political grounds. The war under William lasted from 1689 till 1697 (Peace of Ryswick), and being waged chiefly on the continent, again proved rather advantageous than otherwise to English commerce. The interruption which, says Davenant, writing the year after the conclusion of peace, it "brought to the tillage, labour, and manufactures of other countries produced a great call abroad for our commodities, and much enlarged the export of our home products."¹

There was only a short breathing-space of four years before England and Holland were united against France in another war, the result of which was to place in the clearest light the supremacy of England at sea. This was, to use Seeley's expression, the "business-like" war of the Spanish Succession (1701-13). The main objects of this war, so far as it concerned the two sea-powers, were to prevent France and Spain with the Spanish Indies from being united under one crown, and to secure to England and Holland commercial privileges in the Spanish dominions. The ultimate success of the war was largely determined by the force whose influence is so admirably illustrated in numerous examples by A. T. Mahan, "the noiseless, steady, exhausting pressure with which sea-power acts, cutting off the resources of the enemy while maintaining its own."² For an account of the way in which that power acted, the reader is referred to Mahan's pages.³ Our present purpose is

¹ *Political and Commercial Works* (1771), vol. ii. p. 266.

² *Influence of Sea Power on History*, vol. i. p. 209.

³ *Ibid.* pp 203-224.

served by noting that by the end of 1708 the French people were enduring frightful sufferings, the country was "being destroyed by a strife easily borne by England,"¹ and that, while at the beginning of the war "England was one of the sea-powers; after it she was the sea-power, without any second."²

What seems to have been of most consequence in contributing to bring about this result, was the insularity of England. For a century all Great Britain had been under one crown. Before the close of the war (since 1707) the two countries had a common parliament. The political and commercial interests of both were now entirely one. Then England was larger, had much greater natural resources, and a much greater number of admirably situated seaports. In all her wars Holland, in addition to a paramount sea-force, had to maintain a strong army for the defence of its land frontier. These double charges imposed a heavy burden. The long war with Spain at the time when the United Provinces were fighting for their existence had led to the accumulation of a vast debt, amounting for the province of Holland alone to 15½ million guilders in 1650.³ "In 1685 the public expenses defrayed by the province of Holland were triple in amount to the value of the whole produce of the land." Heavy excise and custom duties had to be levied, so that "it was reckoned that the poorest man paid on excisable articles absolutely necessary for his subsistence, no less than fifty florins, or about £5 annually."

¹ *Influence of Sea Power on History*, p. 215.

² *Ibid.* p. 225.

³ Rogers, *Agriculture and Prices*, vol. v. p. 141.

5. Rivalry with France in the Eighteenth Century

The wars with France that followed in the eighteenth century were essentially, as Seeley insists, wars for dominion across the ocean, and above all for the possession of the parts of North America most valuable to people of the temperate zone. The story is told at length by Seeley, and may be dismissed briefly here. For us it is enough to note the results, and the main geographical factors that contributed to bring about those results. Both Seeley and Mahan note the greater singleness of purpose displayed by England in these wars. While England consistently sought by every means to sustain and extend her power at sea with a view to establishing that transmarine dominion, France was distracted and weakened by European embroilments. It would take us too far to inquire whether France could have kept herself free from these continental embarrassments, but it is important at least to note that the geographical situation of England enabled her to do so. This may be safely pronounced to be the most important of England's geographical advantages in that conflict. Mahan draws attention to a special local advantage, which, though subordinate, was important in those days of sailing-vessels. The relative position of the opposite coast-lines of England and France render the south coast of England, especially in the west, Plymouth and the roadstead of Torbay, a peculiarly effective base. When strong westerly gales were blowing, the English fleet could withdraw in security to either of the shelters, knowing that the enemy could not get out of Brest, and when the wind changed they could at once return to resume the blockade before the French fleet could make its escape.¹

¹ *Influence of Sea Power on History*, vol. i. p. 38.

Throughout these wars the supremacy of England at sea was maintained, not, as is well known, through any lack of valour or seamanship on the part of the French, but in virtue of the predominant position which England enjoyed at sea. On both sides the war produced instances of heroism and magnanimity such as irresistibly call forth our admiration.

France and England were rivals in America and India. Since the voyages of Cabot, England had claimed Newfoundland and the eastern seaboard of North America, and had made good that claim by settlements on the island as well as on various parts of the mainland—Nova Scotia, New England, New York, Pennsylvania, Maryland, Virginia, North and South Carolina, and Georgia. The French, on the other hand, had made settlements in Canada (Lower Canada or Quebec) and in the basin of the Mississippi. Both also had colonies in the West Indies. Both too had gained a footing in India, but neither as yet had acquired much influence there. In 1756 broke out the Seven Years' War, and armies and fleets were brought into conflict in Europe, in Asia, and America, and as usual nations and tribes got involved in it who had no earthly interest in the quarrel. But England retained the command of the sea in commerce as well as in war. She reaped the advantage which Holland had formerly reaped. To her fell the bulk of the profits from increased freights, the insurance of increased risks. The consumers, wherever they might be, whether in England or France, had to pay these higher rates in the long run, but English commerce and shipping, notwithstanding losses here and there, continued to prosper and wax; so that when the war was over English merchants and manufacturers jubilantly raised in the Guildhall (what place more fitting?) a monument to

Chatham, under whose rule "they found commerce united with and made to flourish by war."

The result of the war was that the dominion of the British in North America seemed to be secured, and the foundation was laid of our empire in India.

Every one knows that in a later war the dominion of the British in North America was to a large extent shattered; but from the result of this war, by which France lost Canada, we may perhaps date the assurance of victory for the English language in North America, the fact which makes the United States for us even now, in the words of Seeley, "almost as good as a colony."¹

¹ *Expansion of England*, p. 58.

CHAPTER XXII

THE NINETEENTH CENTURY

1. Statistics of Population

FOR this century we have the advantage of figures in more or less continuous series to illustrate the circumstances of this country with regard to which geographical conditions have to be taken into account. The figures are not all equally reliable, nor is their teaching always equally clear. Still they are very valuable for the light they throw on our subject. As before, I place first the statistics of population as summing up the final result of all the material conditions acting on the inhabitants of this country. The following table shows the returns of each of the censuses of England and Wales down to the last, along with the calculated mean rate of increase per cent per annum between the dates of the successive censuses, account being taken of the differences in the time of the year at which they were taken.

	Mar. 10, 1801.	May 27, 1811.	May 28, 1821.	May 23, 1831.	June 7, 1841.	March 31, 1851.	April 8, 1861.	April 8, 1871.	April 4, 1881.	April 6, 1891.	April 7, 1901.
England—											
Population	8350·9	9553·0	11,281·8	13,090·5	15,002·4	16,921·9	18,954·4	21,495·1	24,613·9	27,483·5	30,811·7
Increase	...	1·33	1·68	1·50	1·37	1·24	1·14	1·27	1·37	1·11	1·04
Wales—											
Population	541·7	611·2	718·5	806·3	911·7	1,005·7	1,111·8	1,217·1	1,360·5	1,519·0	1,714·0
Increase	...	1·19	1·63	1·16	1·24	0·99	1·01	0·91	1·12	1·11	1·22
Scotland—											
Population	1608·4	1805·9	2,091·5	2,364·4	2,620·2	2,888·7	3,062·3	3,360·0	3,735·6	4,025·6	4,472·0
Increase	...	1·14	1·48	1·23	1·03	0·98	0·60	0·93	1·07	0·75	1·06
Ireland ¹ —											
Population	...	...	6,801·8	7,767·4	8,199·9	6,514·5	5,798·6	5,412·4	5,174·8	4,704·8	4,456·5
Increase	...	...	...	1·34	0·54	-2·33	-1·29	-0·69	-0·45	-1·06	-0·54
Decrease	...	...	...	...	...	...	...	...	...	...	...
United Kingdom ²	...	...	...	...	27,036·5	27,724·1	29,321·3	31,845·4	35,241·5	38,105·0	...

¹ In the case of Ireland, the populations (1821-51) are inclusive of army, navy, and merchant seamen on shore and in port estimated to the middle of each year; those for 1851-91 are the census populations, exclusive of army and navy.

² Inclusive of the Isle of Man and Channel Islands, and army, navy, and merchant seamen, natives of the United Kingdom abroad.

2. Statistics bearing on Commerce and Manufactures

As the continuous but more or less varied growth of the population, not only in England but also in the other parts of Great Britain, has been determined principally by the growth of our commerce and manufactures, I place next two tables which will serve to some extent to illustrate these branches of industry. The first table shows the average value of the external commerce of the United Kingdom in quinquennial periods throughout the nineteenth century, so far as the particulars can be obtained. I have not thought it worth while to take any account of "official values," inasmuch as these have absolutely no significance. The rates of valuation for the commodities entered under this heading were fixed in 1694 and not afterwards altered.¹ For each commodity accordingly the custom-house figures would serve to indicate variations in quantity, but an aggregate obtained by adding together "values" so reckoned is as meaningless as a total resulting from the addition of ounces of gold and bushels of wheat. Now there was no record of "real or declared value" of Irish exports before 1805. Accordingly I begin with the quinquennium, 1806-10.² For 1811 to 1815 the average is only for four years, as the records for 1813 were accidentally burnt. In the case of imports and in that of the exports of foreign and colonial produce no record of real values was taken before 1854.

¹ Porter, *Progress of the Nation*, p. 357 (ed. 1851).

² For this period I take the figures on p. 359 of Porter's *Progress of the Nation* (ed. 1851), although they are widely different from the corresponding figures on p. 356.

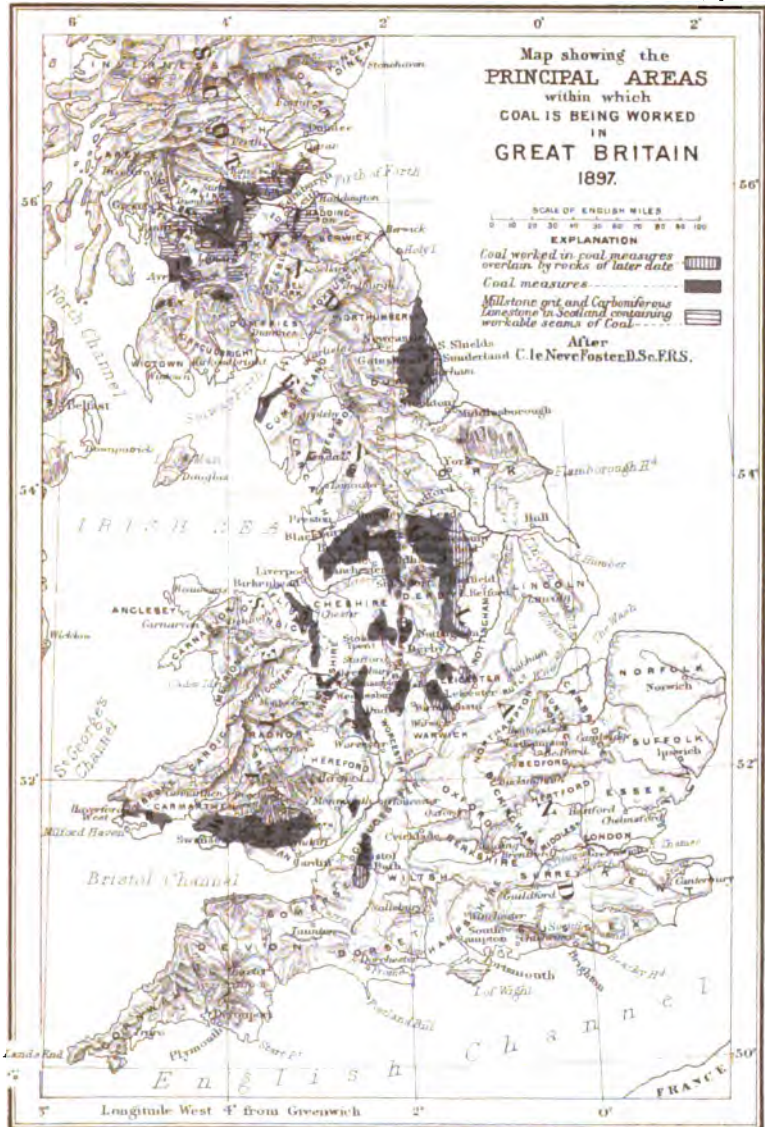
**UNITED KINGDOM, VALUE OF IMPORTS AND EXPORTS IN MILLIONS
OF £ FOR AVERAGES OF FIVE YEARS**

Periods.	Imports. Millions, £.	Exports.		Total.
		British and Irish Produce.	Foreign and Colonial Produce.	
1806-1810	...	39·9	...	...
1811-1815	...	42·2	...	...
1816-1820	...	40·0	...	...
1821-1825	...	37·3	...	...
1826-1830	...	35·7	...	...
1831-1835	...	40·1	...	...
1836-1840	...	50·0	...	...
1841-1845	...	54·0	...	...
1846-1850	...	60·9	...	...
1851-1855	148·0 ¹	88·9	19·8 ¹	108·7 ¹
1856-1860	182·9	124·2	24·8	148·0
1861-1865	247·6	144·4	46·4	190·8
1866-1870	292·8	187·8	46·9	234·7
1871-1875	360·2	239·5	58·2	297·7
1876-1880	382·5	201·4	56·6	258·0
1881-1885	399·9	232·3	63·0	295·3
1886-1890	389·6	236·3	62·2	298·5
1891-1895	417·8	227·0	60·5	287·5
1896-1900	474·3	252·7 ²	61·0	313·7

The next table shows the production of coal in the United Kingdom in 1800, and the amount produced and retained for home consumption in each year since 1854. As the production is almost confined to Great Britain, the districts in which it is produced are nearly all indicated on the accompanying map.

¹ Average of two years, 1854-55.

² New-built ships with their machinery first included in 1899. Even yet the returns do not seem to include old British ships transferred to a foreign register, the total tonnage of which so transferred has greatly exceeded that of new ships built on foreign account in every year from 1893 to 1900 inclusive.



London: Edward Stanford, 12, 13 & 14, Long Acre, W.C.

Stanford's orig. Estab^s

COAL STATISTICS OF THE UNITED KINGDOM

Year.	Amount in Thousands of Tons.		Year.	Amount in Thousands of Tons.	
	Produced.	Retained.		Produced.	Retained.
1800	10,080	...	1877	134,611	119,191
1854	66,661	62,302	1878	132,608	117,113
1855	66,453	61,391	1879	134,008	117,566
1856	68,645	62,696	1880	146,819	128,099
1857	67,394	60,572	1881	154,184	134,597
1858	67,009	60,410	1882	156,500	135,566
1859	73,980	66,898	1883	163,737	134,306
1860	82,043	74,630	1884	160,758	130,531
1861	85,635	77,700	1885	159,351	128,585
1862	83,638	75,257	1886	157,518	127,158
1863	88,292	79,949	1887	162,120	130,408
1864	92,788	83,887	1888	169,935	135,365
1865	98,151	88,868	1889	176,917	139,779
1866	101,631	91,489	1890	181,614	142,955
1867	104,500	93,934	1891	185,479	145,365
1868	103,141	92,174	1892	181,787	142,422
1869	107,428	96,683	1893 ¹	164,326	126,683
1870	110,431	98,728	1894	188,277	145,597
1871	117,352	104,604	1895	189,661	146,768
1872	123,497	110,299	1896	195,361	150,790
1873	127,017	114,399	1897	202,130	154,009
1874	125,068	111,141	1898	202,055	153,798
1875	131,867	117,822	1899	220,095	164,287
1876	133,345	117,046	1900	225,131	166,786

Throughout the century the increase in the tonnage of British shipping has been equally marked. In 1803 the total tonnage of ships belonging to the United Kingdom was 1,986,000. In 1900 it had increased to 14,064,000 tons gross, and 9,304,000 net. But such figures give no idea of the progress in the carrying capacity of British shipping. Not only the constant displacement of sailing by steam-vessels, but the almost equally continuous improvement in marine engines has

¹ A great strike of coal-miners this year.

been steadily giving a different and greatly increased value to the total tonnage of shipping, whatever that tonnage may be. In 1814 there was only one steam-vessel of 69 tons registered as belonging to the United Kingdom; in 1849 the number had increased to 1142 of 158,729 tons; in 1900 to 9209 of nearly 11,817,000 tons gross, and about 7,208,000 tons net.

3. Rate of Increase of Population, 1801-21

It is convenient to have all these figures close together for the sake of comprehensive comparison, but in considering what they illustrate with as much detail as space will permit it will be necessary to add some further figures to throw light on special points.

With respect to the population table we may note in the first place that the variations in the rate of increase in Wales are on the whole parallel to those in England. It will accordingly be enough to confine our attention under this head to the larger country. It has already been pointed out that the high rate of increase in the first period as compared with that in the last ten years of the preceding century throws some doubt on the correctness of the estimates for the close of the eighteenth century. We must note, however, that the rate of increase in both the first two decades of the nineteenth century is high—that in the second decade never exceeded, and that in the first decade only in two subsequent periods. If we consider that the whole of the first decade and more than a third of the second was disturbed by war on a gigantic scale, war involving tremendous efforts, and above all a vast pecuniary sacrifice on the part of this country; and if we consider, moreover, that in both decades the country suffered from bad harvests (1801,

1809-17), we must regard this fact as very remarkable. It calls our attention to the quite peculiar commercial advantages which England at that time enjoyed, advantages which are clearly indicated by other statistics. By the time that the Napoleonic war broke out the mechanical inventions referred to in a preceding paragraph (pp. 325, 326) had already given to England a decisive advantage in all the textile industries. England now began to reap the advantage of its numerous rich coalfields within easy access of the sea in a manner that had never been dreamt of before. Though the demand for machinery had greatly increased that for iron, England was soon able to manufacture enough not merely to supply her own wants but to leave a large surplus for export. In the war that broke out England easily maintained the command of the sea that she had already acquired. After 1805 that supremacy at sea was undisputed, at least in Europe. On the mainland of Europe the war caused a much greater loss of life, much greater destruction, and much greater disturbance to industry than it did in our islands. It was in vain that Napoleon issued his Berlin decrees. In spite of these decrees his own troops were clad and shod with English goods bought by his own agent.¹ Even more significant of the extraordinary temporary advantages belonging at this time to the manufacturing industries of Great Britain, is the following case quoted by Porter from a pamphlet published in 1835: "The writer is acquainted with a merchant who was interested in a house that employed 500 horses in transporting British goods, many of which were landed in Slavonia, and thence conveyed overland to France,

¹ Mahan, *Influence of Sea Power*, upon the French Revolution and Empire, vol. i. p. 273 (on the authority of Bourrienne's *Memoirs*, vol. vii. p. 292).

at a charge of about £28 per cwt., more than fifty times the present freight of merchandise to Calcutta."¹ Had it not been for this peculiar combination of conditions favourable to British industry at this period, it may well be doubted whether England would have been able to bear the extraordinary burdens that she felt herself compelled to undertake.

4. Rate of Increase of Population, 1821-61

The advantages for commerce and manufactures which, since the new inventions, Great Britain enjoys in virtue of its situation, outline, and mineral resources, are still without a parallel in any part of the world of equal extent; but, however great they may be, it is obvious that they were relatively greater when the mineral resources of other countries had not been applied to the new inventions than after that change had taken place. The consequence was that the disturbed state of the Continent during the Napoleonic wars, and the greater exhaustion in continental countries than in Great Britain after those wars, enabled our country to develop manufactures and commerce, and hence also population, to a greater degree than its natural resources and geographical position would have warranted if there had been no other circumstances to take into account. That made it in some respects easier for other countries to gain upon us when they did start in the race. England, in consequence of its excessive prosperity, had more to lose. At a time when industry was rapidly developing all over the western world the loss was not absolute, but relative. Competition was keener. No doubt various other causes, among which must

¹ *Progress of the Nation* (ed. 1851), p. 380.

be included arbitrary fiscal barriers, have contributed in the present century to hinder in some degree the progress of British industry; yet we must recognise the fact just adverted to as one of the causes still operating even in European competition, and it may be doubted whether our industrial progress would not have been steadier and healthier if circumstances had been favourable to the rapid diffusion of the new inventions over all countries which were fit to apply them. The altogether abnormal rate of increase of population in England and Wales (as well as in Scotland) during the decade 1811-21, during which there were six years of peace, may with some probability be partly assigned to the exceptional but to some extent transient relative advantage of Great Britain over continental Europe as regards manufactures and commerce; and the steady decline in the rate of increase during the next four decades may be at least in part ascribed to the decline in the relative superiority of this country. It is true that the mischievous English poor law, especially after the date of what has been wittily called "the Speenhamland Act of Parliament" (1795), when some Berkshire magistrates introduced a rule, which came to be generally followed in England, to grant an allowance to every poor family in the parish in proportion to its numbers where farmers did not pay adequate wages, had an enormous effect on the growth of the population. But this cause acted in the same direction down to the date of the new poor law of 1834, and therefore compels one to seek for other causes to explain the variations in the rate within that period.

5. The Conditions that led to the Adoption of Free Trade

But we must attend to other geographical conditions, or conditions at once geographical and economic, connected with the inventions that gave an entirely different geographical value to the mineral resources of England or rather of Great Britain. During the eighteenth century manufactures, commerce, and agriculture had all gone on increasing hand in hand, any advance in the one giving a stimulus to the other two. Notwithstanding the steady and even rapid increase of population, Great Britain continued to grow enough wheat for its own wants till the eighth decade of the century, but after that time it became increasingly dependent on foreign supplies. Native agriculture, nevertheless, continued long after to extend and advance. The abnormal growth of manufactures and commerce stimulated our own agriculture even while it increased our demand for corn from abroad. In the first part of the century, moreover, native wheat-growers had the protection of a customs' duty for their produce. In the fifth decade, however, that duty came to be felt as an intolerable burden by the manufacturing part of the community. The artisans suffering from the price of provisions demanded cheap corn; the capitalists felt that the restriction on the supplies of agricultural produce was a hindrance to the development of commerce and manufactures. The fierce agitation that then ensued resulted in 1846 in the repeal of the Corn Laws. Since then the conviction in favour of free trade has been deeply rooted in England. In adopting this conviction England, forgetting the true history of the crisis precipitated by the Irish famine, is apt to believe herself to have been vanquished by the stress of argument, and she is consequently scornfully and wonderingly impatient of

the blindness of other nations in not seeing their own advantage in the same policy. But when we feel so much surprise at the slow rate at which other countries, including our own colonies, are convinced by arguments so forcible and so clear as those in favour of free trade, it is only fair to bear in mind that at the time when we ourselves were at last convinced by those arguments, seventy years after their promulgation by our great apostle of the doctrine, free trade happened to be the obvious interest of the most powerful sections of the community. Our manufacturers feared no foreign competition. Their advantages over those of other countries were too overwhelming. On the other hand, a rapidly increasing manufacturing and mercantile population imperatively demanded greater and cheaper supplies of corn than our own agriculture, however stimulated, could furnish. Now that the situation is somewhat changed, there are many examples to show how easy it is even for the perspicacity of Englishmen to get befogged. In the previous century, long before the appearance of the *Wealth of Nations*, about a hundred years before our own adoption of free trade in corn, the merchants and manufacturers of the United Provinces felt themselves in the same position as those of England in 1846. The corn-growing provinces Gelderland, Zealand, and Friesland demanded of the States either prohibition of the import of corn or a protective duty. The proposal was laughed at.¹

Whatever, therefore, may be the inherent strength of the arguments for free trade as a general policy (and it is not our business to question them or throw the slightest doubt on their validity²), it may fairly be

¹ C. M. Davies, *History of Holland*, vol. iii. p. 393.

² Or, on the other hand, to maintain that the policy of free trade is a question to be settled solely on economic grounds.

maintained that it was forced upon us by geographical conditions, or the economic consequences directly flowing in the process of time from such conditions. In any case the adoption of that policy has had far-reaching results. The situation due to the absence of free trade in the first half of the decade 1841-51, may have contributed to the decline again met with in that period in the mean rate of increase of population, though one must recognise also the influence of the new poor law, and the Factory Act of 3 and 4 William IV., as other causes now operating in restraint of the excessive increase of population. Emigration¹ also was now rapid, but in that period this circumstance unquestionably affected Ireland much more than Great Britain. But the adoption of free trade did not prevent a further fall in the rate of increase of population in the ensuing decade. This may perhaps be ascribed in part, at least, to our wars in the fifties in Russia and India.

6. Rate of Increase of Population, 1861-71

A rise in that rate took place, however, in the following period, between the censuses of 1861 and 1871, and

¹ The following table shows the number of emigrants from the United Kingdom in thousands and decimals of a thousand in the intercensal periods 1831-1901 :—

Periods.	Total.	English and Welsh.	Scotch.	Irish.	Foreign.
1831-41	717·9				
1841-51	1692·1				
1851-61	2249·4				
1861-71	1976·6	649·7	158·2	866·6	302·0
1871-81	2244·3	996·0	170·8	530·9	546·6
1881-91	3560·1	1572·7	278·6	741·9	966·9
1891-1901	2659·9	1110·6	188·0	465·1	896·2

that notwithstanding the severe blow inflicted upon our greatest textile industry by the American Civil War of 1861-65. To account for this we must bear in mind, among other things, that, while in some respects we suffered, and that severely, through this war, in others we temporarily gained. The war, of course, involved an enormous expenditure of capital, and that capital was inevitably expended on commodities much of which in the circumstances could be obtained only in this country. Even the cotton industry, heavily as it was stricken, speedily recovered.

7. Rate of Increase of Population, 1871-81

A further rise in the rate of increase of population took place in the decade 1871-1881, and this period deserves a more careful examination, because its opening has been recognised as forming an important economic crisis in our history. It began with a combination of events the ultimate effects of which are not yet exhausted. When the decade opened our two greatest industrial rivals on the continent of Europe were engaged in a conflict of almost unparalleled magnitude. The scene of the war lay, moreover, in the very region of one of those countries in which the industries in which it most strongly rivals us, woollen and linen, are principally pursued. There was a twofold reason, therefore, for these industries being in that country greatly disorganised. But the commodities produced by those industries are necessities of life. They have to be produced somewhere. It might naturally be expected, therefore, that the extensive check to these industries in France and Germany would have the effect

of giving a special stimulus to the same industries in this country.

But the effect of the war did not end there. On the conclusion of the war France became liable to Germany for a heavy indemnity, the payment of which led indirectly to the cheapening of money in that country, to the placing of an increased amount of capital in the hands of the leaders of industry. For the employment of this capital in manufacturing industry there was also the stimulus of high and rising prices which the war had helped to bring about; and no doubt the sense of success in war helped to stimulate the German imagination, and to create more sanguine expectations of success in industrial enterprise. Whatever the cause or causes may have been, the war was in fact followed by a sudden and rapid development of German manufacturing industry. This, again, reacted favourably for the time on the industries of Great Britain. Industrial enterprise required machinery, and Great Britain has been the great seat of that manufacture since the time of the new inventions. A period of great prosperity for the industries connected with machinery was thus brought about, and this of course imparted a strong stimulus to the production of iron and coal.

But we must attend also to some important factors influencing British industries at the same period, but connected with totally different causes. The period immediately before the outbreak of the Franco-German war had been in the United States one of rapid expansion, a fact pretty well indicated by the additions to the railway mileage of that country shown in the following table, which also illustrates one of the effects alluded to in the preceding paragraph.

**RAILWAY MILEAGE, UNITED STATES, AND EXPORTS OF IRON
AND STEEL FROM THE UNITED KINGDOM TO THE UNITED
STATES AND TO GERMANY, HOLLAND, AND BELGIUM.**

Years.	Miles of Railway open, U.S.	Annual Increase.	Exports, Iron and Steel, from the United Kingdom to	
			U.S.	Ger., Hol., Belg.
		Miles of Railway, U.S.	Thous. Tons.	Thous. Tons.
1865	35,085	1177	136	340
1866	36,801	1716	348	255
1867	39,250	2249	432	286
1868	42,229	2979	528	339
1869	46,844	4615	660	431
1870	52,922	6078	832	527
1871	60,293	7879	1064	723
1872	66,171	5878	975	1015
1873	70,268	4097	493	996
1874	72,385	2117	287	592

It would be wholly out of place to consider here the causes of the expansion during the period referred to. In a country so vast in its resources the causes must have been various and complex. We may note as one great cause that it was a period of recovery from the war of 1861-65. We may note also among the special causes having a peculiar interest for us the rapid rise in the production of wheat in 1867-69 after three poor harvests in 1864-66. The general result was that the large additions to the railway mileage of the United States, as well as many of the other incidents of the expansion in that country in this period, combined to give a great additional stimulus to several branches of British industry in the very years in which these branches were experiencing a similar stimulus in Europe from other causes. First the British iron industry was favourably affected, and our table shows that 1871 and 1872,

the years of maximum and greatly enhanced British exports of iron and steel to the United States, partly coincided with the two successive years of maximum export to Germany, Holland, and Belgium. The United States is also our chief market for woollen goods, and without a rival as a market for our linens, and hence it also greatly contributed to the increase of our exports of these commodities in 1871 and 1872.

But, further, we have to note that the year 1872, in which there was an abundant wheat harvest in the United States, was the first of a series of three successive very bad wheat harvests in the United Kingdom. The estimated production of British wheat fell from about 113 million bushels and an average of 30 bushels to the acre in 1871 to about 92 million bushels and an average of 24 bushels to the acre in 1872, about the same in both cases in 1873, while in 1874 there was a further fall to a total of about 80 million bushels and an average of $22\frac{1}{2}$ bushels to the acre. In 1873 and 1874, on the other hand, the American wheat crops were exceptionally bountiful, both in absolute amount and relatively to area. It may be noted that the railway first reached Moorhead in Minnesota in 1871, and crossed the Red River to Fargo in North Dakota in 1872, thus opening up what is now the most productive wheat-growing region of the United States. Before the decade of which we are now speaking was over there occurred the most disastrous wheat year of the century for this country, that of 1879, in which the production fell to about $47\frac{1}{4}$ million bushels, or 16 bushels per acre.

Now from the nature of the stimulus to mining and manufactures, especially so far as it proceeded from the consequences, direct and indirect, of the Franco-German war, it is now obvious that that stimulus could not last.

The collapse came somewhat suddenly in 1873. But it was not so obvious at the time that any such thing must happen, and in any case the speculators that such a time always brings forth could always hope that, if a crash was to come, it would not come while they were involved. And by the time the crash did come lasting changes had been made. New mines had been opened, new blast furnaces erected, new mills had been set in operation both at home and abroad. The means had been provided for making competition in manufactures, both internal and external, keener than ever. The bad harvests at home would no doubt be compensated in course of time by others of exceptional abundance; but meanwhile new railways had been laid in the United States and elsewhere, intensifying manifold the competition of foreign wheat-growers. The combined result in this country was greatly to promote the increase of the mining, manufacturing, and commercial population, partly at the expense of that engaged in agriculture, so that the disproportion between town and country population has greatly increased. As the three sections of the community favourably affected by the stimuli of 1871, 1872, and 1873 already, in 1871, greatly outnumbered in the aggregate the agricultural population, those favourable influences probably go a long way to account for the higher rate of increase of the entire population in the period 1871-81, as compared with the three previous decades.

But it should be carefully noted that the sudden and vast expansion of 1871-73 was followed by a contraction in the first instance almost as rapid and on the whole much more prolonged. This is only a natural consequence of one feature of the period of expansion to which attention has been called, the extensive establish-

ment of factories in foreign countries. The export of linen goods was already below the limit of 1870 in 1873; that of worsted stuffs did not fall below the limit of 1870 till 1876, but the fall was uninterrupted down to 1883, beyond which date no exact comparison can be made with the figures of previous years, seeing that since 1884 certain mixed stuffs previously classed with cotton goods have been included in the export returns among the worsted stuffs, to which they more properly belong. But even with the inclusion of these the amount of worsted stuffs exported from the United Kingdom in one year has never again risen to the amount reached in 1868.

The facts seem to warrant the conclusion that at least a portion of this decline of trade (we cannot say how much) consisted merely in the loss of a trade which we should not have had but for the exceptional circumstances indicated above, and which therefore we were bound to lose when the normal conditions of rival nations was restored. The whole history of the events recounted in the preceding paragraphs serves to show how closely the interests of different nations are now knit together both in peace and war.

In the decade following that just considered it is a noteworthy fact that the mean rate of increase of the population was lower than in any previous period for which there are census returns. It would, perhaps, be unwarrantable to describe any appreciable part of this decline as a continuation of the reaction after the unnatural stimulus to population in 1871-73; but it can easily enough be accounted for in other ways. First, it has been a period of continued decline in arable agriculture. Second, the new conditions of industry and the new methods of transport that originated with us at the close

of the last and in the first half of the present century are still being steadily extended to other parts of the globe, and thus the advantages of England for manufacturing industry and for commerce are being year by year relatively diminished. In recent years this has been chiefly seen in the growing competition in different industries of the United States, Germany, and the East. That part of this competition is due to arbitrary barriers, that is, to hostile tariffs, and not natural conditions, is of course undeniable, but part of it must be recognised as natural and inevitable.¹ Whatever the explanation of the fact, how steady the process has been for the last half-century is pretty well shown by the persistent increase exhibited in the table below in the relative value of our exports of machinery and steam-engines and of coal, the two great means by which we assist in developing the industrial resources of foreign countries. The acceleration of the process since 1880 is particularly notable. Percentage of the total value of exports of British and Irish produce in successive periods of five years² :—

Years . . .	1846-50	'51-5	'56-60	'61-5	'66-70	'71-5	'76-80	'81-5	'86-90	'91-5	96-1900
Machinery, ³ etc.	1.6	1.9	2.8	3.1	2.6	3.6	2.7	5.1	5.6	5.9	6.9
Coal, Clinders, and Fuel	1.9	2.0	2.5	2.7	2.8	4.3	3.9	4.3	5.3	7.3	9

In the last decade it is noteworthy that in England the decline in the rate of increase of population is still continued, and that there is a recovery only in the other two parts of Great Britain, Scotland and Wales. It may

¹ See a paper by the editor of this volume on "Geographical Conditions affecting British Trade," in the *Geographical Journal*, October 1901.

² In calculating these percentages the value of ships exported in 1899 and 1900 has been left out of account, so as to make the figures comparable with those for previous periods.

³ There were legal restrictions on the exports of machinery till 1843.

be that this difference is connected with the fact that it is in these two parts of Great Britain there is the most rapid increase in the production of the important raw material, coal, the increased production of which is now more on foreign than on home account, and the export of which in the period 1896-1900 is estimated, on the basis adopted by the late Sir Rawson Rawson, to have required nearly 43 per cent of the tonnage of all the shipping cleared from the British Isles with cargoes. English manufacturing industries are still, whatever may be the cause or causes, exposed to increasing foreign competition, and it is English more than Scottish, Welsh, or Irish agriculture that has been still further depressed by the increasing imports of grain from different parts of America and elsewhere. Probably both these phenomena are in part to be ascribed to the wealth and enormous purchasing power of the country, evidence of which is amply afforded by our import tables. That wealth is largely increased by the fact that England seems to be at the present time the most attractive place of residence for many who have made their money abroad, whether Englishmen or not. "As our real income increases, we prefer," says Professor Marshall, "to spend its growing surplus largely on such personal services as conduce to domestic comfort, recreation, education, etc. Successive censuses show that a constantly increasing proportion of English people earn their living by rendering personal services to others."¹ If so, they are withdrawn from other branches of industry, the prosecution of which may be indirectly affected thereby in a manner pointed out by Mr. Vilhelm Schou in a paper in the *Journal of the Royal Statistical Society*.² "It would not be difficult,"

¹ *Economic Journal*, vol. viii. (1898) p. 591.

² Vol. lxiii. (1900) p. 315.

says the author, "to find cases where the industries of a country endeavour to remain superior in the competition with foreign countries, but, little by little, they feel their ability to do so weakened by an invisible power, and only upon a closer examination discover that it emanates from that part of their home industries which are under a natural protection, and are not therefore affected by the competition."¹

8. Retrospect

If we now look back on the last three hundred years to the time when the feeling that the world was large and offered room for expansion seemed first to be awakened, when Shakespeare gave expression to the national sense of power and security enjoyed by this "sea-girt isle," we cannot but be struck by the course of events. During almost the entire period the population seems to have been increasing, though not of course always at the same rate. Throughout the period the general prosperity of the country seems to have been growing likewise. For five-sixths of the time agriculture, manufactures, and commerce went on advancing hand in hand, the advances of one stimulating to further advances in the other two. For more than two hundred years the rise of the nation was affected by a constant succession of wars internal or external, the foreign wars being carried on on a larger and larger scale as the empire grew. But these wars seem to have done little to hamper the growth of the nation in arts, industry, and wealth. At times they even brought a distinct accession of at least temporary prosperity to influential sections of the community, if not to the whole

¹ For a fuller examination of the trade of the United Kingdom since 1800 see A. L. Bowley, *England's Foreign Trade in the Nineteenth Century* (1893).

people. The last of these wars was fought on a scale of magnitude hitherto unexampled in the history of the world. The burdens entailed on England by that war have never since been even paralleled, yet England in virtue of its peculiar position at that juncture in European history continued to prosper and to grow in wealth until the war was carried to a successful issue. A remarkable history truly. A remarkable position for a country so small and so far from populous as it then was. The better part of a century has followed, which has largely been a period of peaceful development, a period less disturbed by war on the whole than any equal period in English history. But it is impossible to be blind to the fact that at the close of that period the situation is largely altered. England is still predominant at sea both in its naval strength and its mercantile shipping. But she is no longer so nearly self-dependent as she was in the time of the Napoleonic war, and above all no longer so unrivalled in her industrial supremacy. Since the period 1873-75 we have been dependent on foreign countries for more than half our wheat supply, and that proportion has since increased to more than three-fourths. Great Britain is apparently rapidly getting into a position in which it might be besieged like a city. A population has been brought into existence more and more dependent on cheap supplies of food and raw materials from abroad, and, however great our command of the sea may be, the danger has been created¹ that in time of war the prices of the raw materials might be so raised against us as seriously to affect our industry. We are now in such a position that any such disturbance

¹ How serious this danger was even in the Napoleonic period is shown in a striking article by J. H. Rose in *The Monthly Review* for March 1902.

to our industry would at once beget keen rivalry all over the globe, even within our own empire. We have for ever, through no fault of our own, but through the irresistible march of events, lost the position which we temporarily held through a fortunate combination of circumstances, in which foreign nations, even when at war with us, had no choice but to take our goods and increase our resources.

CHAPTER XXIII

CHIEF TOWNS—ENGLAND AND WALES

1. Early History

THE continuous life of English towns would appear to date in most cases from Anglo-Saxon or later times. As already stated (p. 255), it seems likely that even the more considerable Roman towns were left unoccupied by the Teutonic invaders of Britain. This probable breach in the continuity of the life of the Roman towns seems to be indicated by the dissimilarity between the present names and the Roman names of such towns as have revived on or near the sites of Roman towns and stations. In very few cases has the modern name proceeded from the ancient one by that regular process of linguistic corruption which has been pointed out in the first volume on *Europe* (p. 409), as characteristic of the present French names of ancient Roman towns. The revival or second birth of the town has been due to the operation of the same physical conditions and geographical relations as those to which it owed its origin; but the name is, with few exceptions, more or less new. It was to be expected that seaports should in many cases start up again at or quite close to the spots on which they existed before. Hence we have the Roman Londinium represented by London, Durobrivæ by

Rochester, Dubræ by Dover, Clausentum by Southampton, Isca by Exeter, Glevum by Gloucester, Segontium by Carnarvon, Deva by Chester, Pons Ælii by Newcastle, Eburacum by York, Venta Icenorum by Norwich, and Camulodunum by Colchester. Of these Southampton and Norwich do not occupy the exact sites of the older Roman seaports, the Roman Clausentum having stood on the site of the modern village of Bitterne, on the east side of the small estuary of the Itchen, and Venta Icenorum a little to the south of Norwich at the present village of Caistor-on-the-Tese.¹ Naturally also a number of Roman towns or stations situated at the head of navigation on the rivers on which they stand, or at fords (positions likely in many cases to be identical), have revived. Among towns that may be so described we have the Roman Durovernum represented by Canterbury, Cæsaromagus by Chelmsford, Camboritum by Cambridge, or rather Grantchester, the predecessor of Cambridge, Durolipons by Godmanchester, opposite Huntingdon, Ratae by Leicester, Lindum by Lincoln, Danum by Doncaster, Legeolium by Castleford, Calcaria by Tadcaster. Of the towns on the great Roman roads that owed their existence or importance to other causes, the most noteworthy are Bath, the Roman Aquæ Sulis, a Roman as it is now a watering-place, and Manchester, the Roman Mancunium. Of all these names only three—London, Dover, and perhaps York—can be regarded as directly descended from the ancient name by linguistic corruption. The present name may contain elements derived from the ancient and even distinctively Latin constituents, such as *chester* and its equivalents, and *coln*, as in the names Manchester, Lincoln, Doncaster, Exeter, Gloucester, etc.; but these names are all manifestly new formations, and not to

¹ See *Geog. Jour.* vol. x. p. 513.

be compared to such French names as Limoges, Dijon, Sens, Autun, Orléans, Bourges, and hosts of others which have resulted from the ancient Lemovices, Divio (nem), Senones, Augustodunum, Aureliani, Bituriges, by regular processes of change, to which there are numerous parallels in the French as compared with the Latin language.

2. English Towns in the Middle Ages

Estimates of the population of English towns for the year 1377, on the basis of the subsidy roll of that year, are given by Macpherson in his *Annals of Commerce*.¹ The list is not complete, inasmuch as some of the northern parts of England, including Cheshire, were not comprised in the assessment on which it is based as being under separate jurisdictions. In the parts that are comprised in it thirty-nine towns are named, with a population estimated to exceed 1000; and seventeen of these are not to be found in the list of chief towns at the end of this section. London has a population assigned to it of less than 35,000. York comes next, with a population of nearly 11,000; and Bristol third, with a population of 9500. Plymouth and Coventry follow, each with a population of about 7250, and only two others are named with a population exceeding 5000—namely, Norwich with one of 5900, and Lincoln with one of 5100. The other towns mentioned with a population above 2000, in the order of their numbers, are Salisbury, Lynn, Colchester, Beverley, Newcastle-on-Tyne, Canterbury, St. Edmundsbury, Oxford, Gloucester, Leicester, Shrewsbury, Yarmouth, Hereford, Ely, Cambridge, Exeter, Worcester, Hull, Ipswich, Northampton, Nottingham, and Winchester; and those with a popula-

¹ Vol. i. p. 583.

tion between 1000 and 2000 are Stanford, Newark, Wells, Ludlow, Southampton, Derby, Lichfield, Chichester, Boston, and Carlisle.

Seventeen out of the thirty-nine here mentioned were seaports, and probably fifteen may be reckoned as river-ports. That London should stand first in the list was of course on all grounds to be expected. The high place of York is an index of the productiveness of the Ouse, and that of Bristol of the agricultural wealth of its hinderland, as well as the mineral wealth of the Mendip Hills. It is, however, surprising to find such a small population assigned to Southampton, to the importance of which among English seaports in early times, both before and after 1377, there are many testimonies. An assessment list of the year 1397 gives it a much higher place among English towns, though still far behind Bristol. The amount of its assessment at that date placed it tenth on the list of English towns, instead of thirty-fourth, as in the list of 1377.

The high place given to Plymouth is striking. Its natural harbour, it is true, is excellent, but it lacks any important hinderland. It is not mentioned among the staple ports in the great statute of the staple promulgated a few years before this date. Its importance might perhaps be ascribed to the wealth of the tin mines of Devonshire, which were at one time more valuable than those of Cornwall; but this circumstance might have been expected to give equal importance to Dartmouth, which, a few years after this date, by a statute of the fourteenth year of Richard II. (1490-91), was fixed upon as the sole place for the passage of tin out of the realm.¹

The ports of Norwich and Lynn, the next in rank among the seaports of England, in this list call for no

¹ Hubert Hall, *ubi supra*, vol. i. p. 236.

such comment. Norwich, at the head of navigation of a waterway composed of the Yare and Wensum, reaching far into the interior of one of the richest corn-growing parts of the country, has been for centuries the great distributing centre for a large and populous district. As such it became early the seat of manufactures. The woollen or worsted industry flourished here at least as early as the fourteenth century. Lynn is the outlet of the important navigation of the Ouse basin.

In the case both of Coventry and Beverley ecclesiastical influence must have greatly contributed to the growth of the towns. At Coventry a wealthy monastery was founded in the reign of Edward the Confessor, and under Edward III. important privileges, including exemption from several taxes which would otherwise have been leviable on lands belonging to the monastery, were conferred; and these privileges, together with the wealth of the monastery, would serve to attract a considerable population, which devoted itself to manufactures. Of the former ecclesiastical distinction of Beverley, the chief town of Holderness, there remain as witnesses the two fine churches of the Minster and St. Mary. At the original church of the Minster a convent of monks was founded about 700 by John, Archbishop of York, who is buried there. Here also sundry privileges followed, including a charter in virtue of which, according to Bishop Gibson, one of the editors of Camden's *Britannia*, the inhabitants paid no toll or custom in any port of England. It may be that the monks were attracted here by the remarkable fertility of the neighbourhood, for Arthur Young speaks with surprise on this point on the occasion of his visit in 1770. He remarks that at Bishop's Burton (three miles west of Beverley) the land, even though still cultivated on the open field

system, sometimes yielded six quarters of wheat and six or even seven of barley to the acre.¹ Possibly Beverley might have in 1377 the advantage of being, to some extent, a seaport. At any rate, Leland in 1539 mentions the cut which the inhabitants had by that time made to the Hull river, "whereby preaty vessels cum thither,"—a cut which still survives and serves its original purpose under the name of the Beverley Beck, having been repaired and cleaned out under an Act obtained in 1726. Before Leland's time there was "good cloth-making" at Beverley, but that, he states, was much decayed.

Of the relative importance of English seaports in the reign of Henry VII. (1485-1509) an interesting indication is given in the following table,² showing the total amount of customs duties levied throughout that period at the leading ports. It will be seen that Southampton by that time had risen to the second place among English seaports, though far behind London.

	Thous. £		Thous. £
London . . .	444·7	Bristol . . .	30·6
Southampton . .	170·2	Exeter and Dartmouth	28·2
Boston . . .	57·6	Hull . . .	24·9
Newcastle . . .	45·8	Sandwich . . .	13·5
Ipswich . . .	40·4	...	

3. Modern Towns—General Considerations

In the table at the end of this chapter I have endeavoured to give a view of the growth of the principal towns of England in a geographical sense during the nineteenth century, or rather from the first English census to the last. The attempt is one that cannot be

¹ *Tour in the Northern Counties*, i. pp. 147, 148.

² Compiled from Schanz, *Englische Handelspolitik gegen Ende des Mittelalters*.

rigorously carried out. No definition of a town in a geographical sense has yet been attempted, and no census has ever been taken in which populations were separately returned for geographical towns, as distinguished from municipal or other areas with definite boundaries, fixed for purely local reasons. From a geographical point of view such boundaries as those between Birmingham and Aston Manor, Manchester and Salford, Liverpool and Bootle, Plymouth and Devonport, Brighton and Hove, serve only to mislead; and in the table referred to I have taken a town to mean an urban aggregate, and have aimed at including under one town all places with an unbroken urban population. In some cases the places bearing different names never were geographically different. Manchester and Salford, for example, have grown side by side from practically the same centre; and probably there is a considerable proportion of Manchester people who cannot tell when they are in Manchester and when they are in Salford. It must, however, be recognised that even on geographical grounds a distinction may reasonably be made between those cases in which an urban area has spread from one centre and those in which the aggregate has been brought about by the meeting of urban areas growing from different nuclei. Even in such cases the different growths may ultimately become merged as completely in one as to be indistinguishable by any marked feature. Such has been the case with London and Westminster, the unity of which has long been so complete as to force itself on popular and even official recognition. It is, however, different with the great urban area on the borders of Staffordshire, Warwickshire, and Worcestershire. There several nuclei are still clearly recognisable, and I have therefore aggregated the population of the area about the

five parliamentary boroughs of Birmingham, Wolverhampton, Walsall, Wednesbury, West Bromwich, and Dudley; but, at the same time, have endeavoured to give the entire population for this urban area under the head of Greater Birmingham. But the endeavour in this and many other cases is no more than an endeavour. I have not the means of distinguishing truly urban areas. It is almost certain that in nearly every case the population given is less than the true urban population. I have at least always united two boroughs or towns which are obviously geographically one. Where there are two different local boundaries—a municipal and a parliamentary—I have always chosen that which included the larger population, feeling sure that it was at least nearer the truth from a geographical point of view. The populations for 1801 and 1851 are not those for the same areas as in 1901, but the places entered as towns at the same dates in the respective census returns; but in some cases I have endeavoured to give in addition the aggregate population of the places of which the modern town is composed, although at the earlier dates these populations must have been largely discontinuous. Where there was no town at the earlier dates, the best equivalent population that I could insert has been supplied. The table includes all boroughs and urban districts, not parts of larger urban aggregates, which had in 1901 a population of at least 40,000; and with all its imperfections, I trust it will be found of more geographical interest than one that paid attention to boundaries determined by such a variety of local interests as are known to influence the demarcation of administrative frontiers.

A glance at the table shows that the growth of most of the great towns of England belongs to the nineteenth

century. At the date of the first census (1801) no town except London had a population of as much as 100,000, and only five besides London—namely, Manchester, Liverpool, Birmingham, Bristol, and Leeds—had one exceeding 50,000. The era of great towns has followed the enormous development of manufacturing industry and commerce which was ushered in by the great inventions of the latter part of the eighteenth century, and stimulated by the equally remarkable development of the means of communication by land and sea which has gone on continuously since that time. Of the ninety-three towns or urban aggregates enumerated in the table referred to, the great majority are either seaports or towns on coalfields. All English seaports have had their growth promoted by the commercial progress of the past century, but, above all others, those which presented the greatest advantages in respect of local conveniences and geographical situation for the concentration of trade in large ships, such as are required by the vast commerce of the present day. In such commerce nearly all harbours that are at all adapted for it have had to be greatly improved, but the improvements have been steadily carried out as the requirements of the hinterlands demanded them. Three large seaports, which have now far outstript many of those of old renown, are entirely the result of modern conditions. These are Barrow, Middlesbrough, and Grimsby, the first two due to the growth in each of a gigantic iron industry, the third a railway creation. Barrow was founded in order to take greater advantage of the excellent Furness iron ores, and now has extensive blast-furnaces, steel-works, and ship-building yards. Middlesbrough has grown up since the discovery of the Cleveland beds of iron ore, the most productive deposits of the kind in the United Kingdom. Grimsby has been

developed by the Manchester, Sheffield, and Lincolnshire, now the Great Central Railway, in connection with the fish trade, and as a rival to Hull for continental traffic.

Of the towns included in the list now under consideration, several, which are neither seaports nor industrial towns, are almost equally remarkable for the rapidity of their growth, and this growth is equally though indirectly due to the same causes as have brought about the growth of those towns which form the majority. The towns referred to are watering-places and other health-resorts, such as Brighton - Hove, Eastbourne, Hastings, Bournemouth, Bath, Blackpool, Southport, etc., the prosperity of which bespeaks the wealth which manufactures and commerce have created.

Though the growth of industrial towns has been in most cases the work of coal and railways, yet it is worthy of notice that the situation of most of them had been determined by local conditions before coal came to be greatly utilised or railways had been introduced, and that with very few exceptions the inland towns mentioned in the list at the end of this chapter had their development stimulated by inland waterways in existence before the time of railways, or from the earliest days of railways.

The importance of this circumstance is apt to be underestimated in view of the inferior position to which canals have sunk since the introduction of railways; but it will be better understood when it is considered that before this time the revenues of some of the English canals allowed of a dividend of 30 and even 90 per cent.¹ The only inland towns in the list that have not had that advantage are Accrington (which is, however, only about

¹ *Banking, Railway, and Canal Statistics, Ireland*, issued by the Department of Agriculture and Technical Instruction for Ireland [Ed. 1032], 1902.

a couple of miles from the Leeds and Liverpool Canal), Darlington, Crewe, Rhondda, and Swindon. Canterbury originally had the advantage of a waterway in the Stour, though it has that advantage no longer. Accrington and Rhondda have the advantage of local coal to compensate the disadvantage of distance from a waterway, amounting in the case of Rhondda to nine miles. Darlington, Crewe, and Swindon have neither coal nor a waterway, but this is compensated in the case of Darlington by the vicinity of the Durham coalfield and the port of Stockton-on-Tees, and its growth as a manufacturing town was originally stimulated by the water-power of the Skerne, which, more than a hundred years ago, was largely employed in corn, linen, and other mills. Now it has the locomotive works of the North-Eastern Railway Company, and it may here be mentioned that the railway connecting this town with its port was the first public railway opened in the kingdom (1825). Crewe and Swindon are both entirely railway creations: Crewe the seat of the great locomotive works of the London and North-Western Railway, Swindon that of those of the Great Western Railway Company. In both cases cheap land on the route of the respective railway was chosen for the site, and Crewe has the additional advantage of not being far from the coalfield of North Staffordshire, Swindon a similar advantage with respect to the Bristol coalfield.

With regard to local government a few of the great towns of the country are treated at some length in the following chapter, but here a few particulars may be added with respect to the causes which explain the growth of some of the most important of them.

4. London

Necessarily the first place in this consideration belongs to London, the most important commercially of English towns from Roman times downwards, and the capital of the country throughout the greater part of English history. It stands on the most important of English rivers, with an estuary admirably adapted by nature for shipping, its mouth only about a hundred miles from that of the Scheldt, at the head of which, in a somewhat similar situation, stands the great continental port of Antwerp. The precise site of the town may, however, be better compared with that of Hamburg.¹ The nucleus of both towns occupied a piece of comparatively high and firm ground, advancing close up to a river-bank elsewhere marshy. Both, too, stand at the lowest spot where the river could be bridged. The original London Bridge, on the site of the present one, dates from Roman times, and so early that republican coins had not yet gone out of circulation. By the construction of that bridge, both north and south banks of the Thames were brought within the hinderland of London, and the focus of London trade was fixed for ever. Indirectly the construction of that bridge may be said to have determined the locality in which the Royal Exchange and the Bank of England were afterwards to stand. In Roman times the great high-roads of Britain may be said to have radiated from either end of that bridge, and now that railways have been introduced, London Bridge may be described as the focus towards which the great railway lines converge, although their termini have been kept at a greater or less distance by the enormous cost of land.

¹ See vol. i. pp. 541, 542.

For many centuries the capacious river afforded accommodation for all the shipping of the growing port. The first dock was the Howland Great Wet Dock at Rotherhithe, a private undertaking opened in 1660, and afterwards known as the Greenland Dock. The next was another private dock, the Brunswick Dock at Blackwall, opened in 1790. Down to the beginning of the nineteenth century most large vessels discharged in the



[Photo by York and Son.]

LONDON BRIDGE, WITH THE MONUMENT AND BILLINGSGATE MARKET.

river, and had their cargoes conveyed in lighters to quays, with an aggregate length of about one mile. In the last year of the eighteenth century the first dock of the port of London on the north bank of the Thames, the West Indian Import Dock, in the Isle of Dogs, was begun. It was opened in 1802. The first of the London Docks followed in 1805, the East India Import Dock in 1806, and the St. Katharine's Dock (partly on the site of St. Katharine's Hospital, founded in 1148 by Matilda of

Boulogne, wife of King Stephen) in 1828. Now all the alluvial promontories of the Thames on the north bank, from the Tower to North Woolwich, as well as the similar promontory on the south bank (in Rotherhithe and Deptford), are occupied by docks, and lower down on the north bank docks with an aggregate water-area of $54\frac{1}{2}$ acres were opened at Tilbury in 1886. The river itself has also been deepened to meet the requirements of modern shipping, and a navigable channel of 25 to 26 feet at low-water ordinary spring-tides exists as high as Tilbury. The port is admittedly one of the most expensive in the world, but the enormous local market which Greater London itself provides continues to attract increasing quantities of shipping, so that all these improvements still leave the port inadequate for the wants of the time. Merchants and shipowners complain of delays as well as direct expenses, and maintain that the losses thereby incurred are sending away to other ports, both at home and on the continent, much commerce which would otherwise go to swell more than of the port of London. The provision of increased facilities for traffic at this port is, therefore, one of the most keenly discussed problems in the capital of the empire.

The nature of the commerce of London is largely determined by two circumstances—the large consuming population in London itself, and its relation to the mainland of Europe. It is due to these circumstances that its import is so enormously in excess of its export trade, as well as of the import trade of any other port in the kingdom. Articles of universal consumption, and of comparatively small bulk in proportion to their value, and hence comparatively easily redistributed, such as tea, coffee, cocoa, and spices are almost all brought to London,

which also takes the lead by a long way in the import of wine, preserved fruit, fresh mutton, potatoes, glass, slate, and also in wool. This last is the one bulky article in the import of which London predominates to almost as great a degree as in tea, coffee, cocoa, and spices. This is probably to be ascribed in part to the relations of London to the mainland of Europe, which receives the bulk of the articles of foreign and colonial origin exported from this country. Of this trade London has by far the largest share—more than half the total value; and among the articles of such origin exported by far the most important is wool. But this trade is no doubt also largely promoted by the fact that London is the great consuming centre at home for all the varied articles of the kind which are sent to the wool-producing countries, and hence the most convenient port of despatch for such articles in the trade with those countries. These two circumstances have probably combined to make London the greatest woollen market in the world, although not so conveniently situated as Hull for the woollen manufacturing district of England. Among the few exports in which London takes the lead among British ports are boots and shoes, jute piece goods, cement, and candles.

5. Birmingham and the Adjacent Towns

We have already seen in a former chapter (pp. 312, 313) one of the causes to which the towns of this group owed their origin—the existence of a large quantity of iron-ore, which, when smelted by the charcoal obtained from the neighbouring forests, yielded a kind of iron suitable for making nails and a large number of other articles. But in addition to that the district was, as it still is, rich in coal. Now already in the seventeenth century, this coal,

though it could not be used in the smelting of the ore, was of great value in smith's work, and hence the softer and more pliable iron of the Forest of Dean, well suited for all kinds of wrought-iron work, was sent up the Severn to the forges which abounded here as early as Leland's time (1539); and "because of its kind and



G. W. Wilson, photo.

CORPORATION STREET, BIRMINGHAM.

gentle nature to work it is now," says Yarranton, "at Sturbridge, Dudley, Wolverhampton, Sedgley, Wasall, [Walsall] and Birmingham, and thereabouts, wrought and manufactured into all small commodities, and diffused all England over . . . and when manufactured sent into most parts of the world."¹ It was this circumstance that suggested to Yarranton his scheme for making the

¹ *England's Improvement by Land and Sea*, pp. 56, 57.

Stour navigable (1666), a project not then realised, and the design of which was not fulfilled till rather more than a hundred years after, when the Stafford and Worcester Canal, connecting the Trent and the Severn, was constructed by Brindley. About the same time Birmingham, which itself has neither coal nor iron, became connected by canal with various parts of the South Staffordshire coal-field, and also with the Severn at Worcester. The first Act for the construction of the Birmingham canals, which now radiate from Birmingham in all directions, from west to north-east, was obtained in 1768. Birmingham grew in population more rapidly than the adjoining towns. According to Gough, the editor of the 1789 edition of Camden's *Britannia*, it had in his time added 25,000 to its population since 1741. Its various advantages caused it to be selected by Boulton and Watt for the seat of the first great factory of the steam-engines invented by the latter; and since then all kinds of metal-work, large and small, have been manufactured there and in the neighbouring towns. Fire-clay and sand add to the resources of the district, and have created the glass and fire-brick industries which predominate at Stourbridge, where glass-houses have existed since the sixteenth century, when they were introduced by settlers from the continent. Birmingham and the adjoining towns now form the greatest urban aggregate outside of London, and in this aggregate it still takes the lead, as it has long done. It led the way in the midlands in municipal enterprise, and latterly has sought to take a front rank also in education. From 1875 it has been the seat of Mason College, which in 1900 was raised to the dignity of Mason University College, the seat of Birmingham University, on which a charter was then conferred. Appropriately this university is aiming at raising the

standard of industrial and commercial education, and with that view is organising a faculty of commerce.

6. Manchester

The physical configuration of the part of England in which Manchester lies makes its site the almost inevitable focus of all the pack-horse tracks, and afterwards of roads, from the north-east, east, and south-east leading across the Pennine Chain to the south-east of Lancashire, as well as of others, from the north and north-west, crossing detached parts of that chain.¹ From the year 1720 Manchester also had the advantage of a water-way leading westwards in the Irwell; but it is a notable fact that the predominant partner in the pair of municipalities that make up the larger part of this great town, is that which is turned to the Pennines, not that which looks to the Mersey. The convergence of tracks or roads on this site must of itself have made Manchester a trade-centre of exceptional importance as compared with other neighbouring sites, and its trade relations would make it a convenient distributing centre for manufactures. It is not surprising, therefore, that manufactures grew up here at an early date. Manchester was known for its textile manufactures as far back as 1328.² We have already seen (p. 327) the nature of these manufactures in early days. When the great inventions revolutionised the cotton industry (p. 326), it gradually became the great centre of trade in connection therewith, and its population grew with hitherto unparalleled rapidity. In 1773-74 the population ascertained for the

¹ See *Geog. Jour.* vol. x. p. 527.

² Leone Levi, *History of British Commerce*, p. 5.

two townships of Manchester and Salford was 27,200;¹ at the census of 1801 almost exactly 84,000. This was about 94 per cent of the total population of the two municipalities, but probably even that was less than that of the true urban aggregate. Even before the earlier of the dates mentioned, Manchester had the advantage of other water communication than that of



MANCHESTER TOWN HALL.

Frith, photo.

the Irwell. The Bridgewater Canal, bringing coals from Worsley, was completed eastwards to Manchester in 1761, and in 1776 the connection with the Mersey at Runcorn by this canal was effected, and by the year 1798 there was water communication eastwards from Manchester through Ashton as far as Stalybridge at the foot of the Pennines. Early in the following century, under an Act obtained in 1806, the connection by water

¹ Wheeler's *Manchester*, p. 249.

with the Humber was completed by way of Saddleworth, Huddersfield, and Wakefield; and about the same time another water-way across the Pennines by Rochdale, Todmorden, Halifax, and Wakefield by the construction of the Rochdale Canal under the Acts of 1794 and 1806. From 1821 Manchester was in communication by water with the Leeds and Liverpool Canal at Wigan by a branch running through Leigh. When railways were introduced all these connections were, of course, confirmed and enlarged. Finally, in 1894, Manchester was made a seaport by the opening of the ship-canal, $35\frac{1}{2}$ miles long and 26 feet deep, connecting it with the Mersey at Eastham. So important for the community was this work felt to be, that the Corporation of Manchester lent £5,000,000 towards its construction; and though this still forms a large burden on the rates, it is locally recognised that it is a burden for which there is already a large if not an adequate compensation in the reduction that has taken place in the cost of carriage of commodities.¹ All these improvements have at any rate steadily added to the importance of Manchester as a business centre; and it is not too much to say that for all South Lancashire and the adjoining districts on the west side of the Pennines, Manchester has marked the culmination of growth in all departments. In 1851 Owen's College, the first great seat of the higher education in this region, was founded, and in 1880 it was made the headquarters of Victoria University, when that university was constituted by the affiliation of Owen's College; University College, Liverpool; and the Yorkshire College; Leeds. At the present time a movement is on foot for the erection of these colleges into separate universities.

¹ See a paper by Mr. Woodroffe Fletcher, LL.P., in the *Trans. Manchester Stat. Soc.* 1897.

7. Liverpool

The circumstances which retarded the growth of Liverpool as a port, in spite of the excellence of the accommodation for shipping afforded by the Mersey, have already (pp. 89, 90) been pointed out. The first foreign trade of the port was that with the West Indies, founded about 1670. This was followed in 1703 by the slave trade, which was carried on vigorously till the trade was abolished by Parliament in 1807. But Liverpool suffered long from the lack of landing accommodation. Down to 1715 ships had to lie out in the Mersey, exposed to the action of strong tides. Not till the development of manufactures in its hinderland, more particularly in and round Manchester, did it become worth while to lay out money on docks. The first dock was opened in 1715, a second in 1753, and a third in 1771. About this time Liverpool was visited by Arthur Young, who mentions that vessels of as much as 900 tons could then approach the quays, and states that the population of the town was then supposed to be near 40,000. By this time the glass-houses of St. Helens had been brought into connection with the Mersey by the Sankey Canal, constructed under the Acts of 1755 and 1762, and the salt trade had grown up in consequence of the opening of the Weaver navigation in 1725. A connection with the potteries was established by the Trent and Mersey Canal,¹ which was begun in 1766 and completed before 1789, and in 1775 was brought into connection with the Weaver navigation by a hydraulic lift at Anderton. The water-way across the Pennines by way of Wigan, Chorley, Blackburn, Burnley, and Skipton to Leeds,

¹ See above, p. 189.



Frith, photo.

LIVERPOOL FROM THE MERSEY.

known as the Leeds and Liverpool Canal, was begun at both ends in 1770, but was not completed till 1816, when the last section, Blackburn to Wigan, was opened. At the present day Liverpool has for its hinderland the entire manufacturing district west of the Pennines, even as far as Birmingham, the difficulties in the way of providing accommodation for large shipping at the Severn ports preventing hitherto even Bristol from being an adequate competitor for the trade of the southern midlands. Even the Yorkshire manufacturing district east of the Pennines is included in the Liverpool hinderland in relation to oceanic traffic, as is shown by the fact that the greater part of the worsted coatings and stuffs exported from the United Kingdom are despatched from this port. Altogether, about one-third of the total value of the goods of British and Irish origin exported from the United Kingdom find their way out by this exit, though the value of the imports of the port is considerably less than one-fourth of the whole. Necessarily the accommodation of the port has kept pace with the growth in traffic. The total dock accommodation is now 1611 acres with 35 miles of lineal quay space, of which 1105 acres with $25\frac{2}{3}$ miles of quays are on the Lancashire, 506 acres with 9 miles of quays on the Cheshire side.¹ For the further extension of the docks about 340 acres of land have been bought by the Mersey Docks and Harbour Board at Seaforth beyond Bootle, at the entrance to the Mersey. Formerly, the entrance to the port was greatly impeded by a bar, but by dredging the depth throughout the Crosby Channel has been increased to 27 feet at dead low-water.

¹ Birkenhead is included in the port of Liverpool.

8. The Towns of the West Riding

On the east side of the Pennine Chain there is no site which can be described as a natural focus of tracks or roads in the same degree as Manchester on the west side. The greater extent of open low ground on this side has given rise to points of convergence at the mouths of the Pennine valleys. Of these Leeds is the most important, but it has a rival from this point of view in Sheffield, and, to a smaller degree, in Wakefield and Barnsley. It is probably to be ascribed, at least in part, to this circumstance that Leeds has not grown so rapidly as Manchester. In 1801 Sheffield was the only town besides Leeds in the West Riding of Yorkshire with a population exceeding 10,000. Its population then amounted to 31,300; but that of the parish, which was not much more extensive than the present county borough, was nearly 46,000. Though, as we have seen (p. 324), Leeds, Halifax, and Wakefield became noted as seats of the woollen industry in the fifteenth century, it was rather vast parishes than towns in which the industry was carried on, and the towns grew but slowly. The parish of Halifax embraced all the Calder valley above the confluence of the Colne, extending westwards to the frontier of Lancashire, with a length of about 17 miles and an extreme breadth of about 6. Though at the census of 1801 it had a population of 63,000, the town was then credited with less than 9000. Concentration on this as on the other side of the Pennines seems first to have been promoted by commerce and afterwards by machinery. Leeds and Wakefield, the towns at the mouths of their respective valleys, seem to have been the first towns to become important in this

district. In 1699, in petitions which they presented to Parliament in support of a Bill which was passed in that year for making the Aire and Calder navigable to these places, they describe themselves as the principal trading towns in the north for cloth, and Leeds laments the disadvantage of having no water carriage within 16, Wakefield that of having none within 22 miles; and Wakefield adds that in consequence the goods are "sometimes forced to stay two months while the roads are passable to market, and many times the goods receive considerable damage through the badness of the roads by overturning." This work was apparently taken in hand at once, and, as already mentioned under Manchester, connections were afterwards made between both valleys and the other side of the Pennines. The canal up the Aire valley (Leeds and Liverpool) was completed beyond Skipton to within a few miles of the Ribble in June 1777, and before that a branch had been made to Bradford (1776). This last connection was important from the fact that Bradford is specially favoured in the abundance of its supply of pure soft water, such as is required for the washing and scouring of wool. Hence, there is no other town in the world in which so much wool is prepared for spinning and manufactured. It is largely exported thence in the form of "tops" (bundles of slivers or strands of loose combed wool), but largely also manufactured in Bradford itself into yarns and worsted goods. Leeds, so far as wool is concerned, is now more largely occupied with the manufacture of ready-made clothing; but also has extensive iron, steel, and other industries. Many other towns of the West Riding have each their special branch of the woollen industry.

9. List of Towns (Urban aggregates) which at the census of 1901 had a population of 40,000 or upwards, with the populations in thousands in 1801, 1851, and 1901

C. = County borough. M. = Municipal borough. P. = Parliamentary borough. U. = Urban district. p. = parish. tp. = township.

	1801.	1851.	1901		1801.	1851.	1901.
Greater London ...	...	...	6581 ¹	Birmingham-			
County and City				Aston-Manor	74	239	599 P. ¹¹
of London .	959 ²	2363 ²	4537	Leeds .	52	172	429 C.
Greater Birming-				Sheffield .	43	135	381
ham ³ .	...	...	1294	Bristol .	64	137	329
Manchester-				Newcastle-			
Salford .	95	401	P.764 C. ⁴	Gateshead .	42	114	325
Liverpool-Bootle	78	380	744 C.	Bradford, Yorks.	6	104	280 C.
			& M. ⁵	„ .	27 ⁷	137 ⁷	280 ⁷

¹ Metropolitan and City of London Police Districts, including all the county of Middlesex, in which are the urban districts of Edmonton, Enfield, Hornsey, Tottenham, and Willesden, each with more than 40,000 inhabitants in 1901, but not separately entered in this list as being really parts of one urban aggregate with the rest of London, and the following places in other counties with a population above 40,000 at the same date:—Croydon and Wimbledon in Surrey; and East and West Ham, Ilford and Walthamstow in Essex.

² London within the bills of mortality.

³ The parliamentary boroughs of Birmingham, Aston-Manor, West Bromwich, Wednesbury, Walsall, Wolverhampton, and Dudley, together with the urban districts of King's Norton and Northfield, Smethwick, Handsworth, and Stourbridge.

⁴ The addition of the urban districts of Withington, Swinton, Pendlebury, and Eccles, and the civil parish of Stretford, all of which belong to the same urban aggregate, would bring up the population in 1901 to at least 900,000.

⁵ The true urban area round Liverpool is much larger, but the returns at present issued afford no means of estimating the population of the whole urban area.

⁶ With the addition of the urban districts of King's Norton and Northfield, Smethwick and Handsworth, all of which belong strictly to the Birmingham urban aggregate, the total population in 1901 was 764,000.

⁷ Within present limits.

	1801.	1851.	1901.		1801.	1851.	1901.
West Ham . . .	6 p.	19 p.	267	Derby . . .	11	41	106 C.
Potteries . . .	...	120 ¹	250 ²	Halifax . . .	9	34	105 C.
Hull . . .	30	85	241 C.	Burnley . . .	5 ⁶	21	97 C.
Nottingham . .	29	57	240 C.	Dudley . . .	10 M.	38 M.	97 P. ⁷
Leicester . . .	17	61	212 C.	Huddersfield .	7	31	96
Oldham . . .	22	72	194 P.	East Ham . . .	1 p.	1·5 p.	96 U.
Wolverhampton	13 tp.	120	193 P.	Swansea . . .	6	31	95 C.
Plymouth-				Northampton .	7	27	87 C.
Devonport . .	43	102	183 P.	Hartlepool . .	1	10	86 P.
Portsmouth . .	32	72	189 C.	Hastings . . .	3	17	86 P.
Bolton . . .	18	61	168 C.	Walsall . . .	5	26	86 M.
Birkenhead-				St. Helens . . .	...	15	84 C.
Wallasey ³ . .	0·4	25	165 M.	Rochdale . . .	6	29	83 C.
			& U.	Stockport . . .	20 ⁸	54	79 C.
Cardiff . . .	2	18	164 C.	Grimsby . . .	3	12	78
Brighton-Hove	7	70	160	York . . .	17	36	78 C.
Sunderland . .	27	67	159 P.	Reading . . .	10	21	72 C.
Croydon . . .	6 p.	20	134 C.	Wednesbury . .	4 p.	12	72 P.
S. Shields-				Coventry . . .	16	37 P.	70 C.
Jarrow . . .	13 ⁴	33 ⁴	132 M.	Ipswich . . .	11	33	67
Blackburn . . .	12	47	128 M.	Newport . . .	1	19	67 C.
Merthyr-Tydfil	1	63	123	W. Bromwich . .	6 p.	35 p.	65 P.
Southampton .	8	35	120 P.	Warrington . .	11	23 P.	64 C.
Preston . . .	12	70	118 P.	Wigan . . .	11	32	61 C.
Middlesbrough	0·2 p.	7	117 P.	Barrow ⁹ . . .	...	...	58 C.
Rhondda . . .	0·5 ⁵	2 ⁵	114 U.	Bury . . .	7	31	58
Norwich . . .	36	68	112 C.	Rotherham . . .	3	6	54 C.
Chatham-				Bath . . .	33	54	53 P.
Rochester . .	21	52	109 P.	Cheltenham . .	3	35	53 P.

¹ The parish of Stoke-upon-Trent and the townships of Longton, Hanley, Tunstall, Newcastle-under-Lyme, and Burslem.

² The contiguous parliamentary boroughs of Hanley, Stoke-upon-Trent, and Newcastle-under-Lyme. In this area parliamentary and administrative boundaries differ widely from one another.

³ Including New Brighton.

⁴ The townships of Westoe, South Shields, Hedworth, Monkton, and Jarrow.

⁵ Parish of Ystradyfodwg.

⁶ Townships of Burnley and Habergham Eaves.

⁷ The parliamentary borough includes Brierley Hill.

⁸ Including entire townships of Heaton Norris, Cheadle Bulkeley, and Cheadle Moseley, of which only parts belong to the borough of Stockport.

⁹ As late as 1851 merely a hamlet in the parish of Dalton-in-Furness.

	1801.	1851.	1901.		1801.	1851.	1901.
Exeter . . .	17	41	53 P.	Stalybridge . . .	...	21	47 P.
Lincoln . . .	7	18	52 P.	Worcester . . .	11	28	47 C.
Stockton-on-Tees 4tp.	10tp.	52 M.		Carlisle . . .	10	26	46 M.
Tynemouth . . .	4	29	52 M.	Chester . . .	15	28	46 P.
Ashton-under-				Darlington . . .	5	11	45 M.
Lyne . . .	16	30	51 P.	Aberdare . . .	1·5	15	43 U.
Yarmouth . . .	17	31	51	Accrington . . .	...	7	43 M.
Burton . . .	5	8	50 C.	Eastbourne . . .	2 p.	3 p.	43 M.
Morpeth . . .	5	10	50 P.	Crewe . . .	...	4	42 M.
Oxford . . .	12	28	49 C.	Dover . . .	15	22	42 M.
Cambridge . . .	10	28	48 P.	Wakefield . . .	8	22	42 M.
Gloucester . . .	8	18	48 C.	Wimbledon . . .	1·6 p.	3 p.	42 U.
Southport . . .	...	5	48 M.	Ilford . . .	2	4	42 U.
Blackpool . . .	...	24	7 M.	Barnsley . . .	4	13	41 M.
Bournemouth . . .	...	...	47 M.	Lancaster . . .	9	16	40 M.
Hythe . . .	7	13	47 P.	Leigh . . .	1	5	40 M.

CHAPTER XXIV

LOCAL GOVERNMENT—ENGLAND AND WALES

FOR purposes of local government England and Wales are divided into counties, and these into parishes. Parishes are variously combined into districts, unions, and other groups. The larger towns are incorporated as boroughs or cities.

Thus are formed areas, to each of which a certain measure of self-government is entrusted. Within every such area a council is elected or appointed—it is almost invariably elected—with various powers. Some elective bodies are narrowly restricted in the range of their duties and powers. School Boards, for example, are confined to the administration of the Education Acts.

1. The Parish

The smallest area which has any powers of self-government is called a parish. It has the least measure of independence, for, of course, all the larger localities of which it forms part exercise their authority within it. Parishes vary enormously in area and population, in spite of the fact that so many populous ones have been divided into two or more, that, during the past hundred years, their number has been increased from little over ten

thousand to nearly fifteen thousand. Originally the parish was what its name implies—the district to which a priest ministered, but for centuries it has been a civil as well as an ecclesiastical locality, and now the civil parish and the ecclesiastical are almost entirely distinct.

As an area of local government the parish succeeded to the Anglo-Saxon township.¹ The transition from township to parish was made during the feudal era. When the land was parcelled out into manors, and the rights of the people were in danger of extinction, the priest stepped forward to defend them. He summoned his parishioners to meet in the parish church to discuss their local affairs, and thus were transferred to the parish whatever rights or duties of the ancient township had not been seized by the manor. Other powers were afterwards added. For some centuries parish and manor existed side by side, but the parish gained in importance while the manor declined. In the reign of Elizabeth the duty was laid upon the parish of providing for its poor. For this purpose it was to appoint overseers who were to assess and levy a rate, so that a fund might be provided out of which relief should be given. This distribution of relief is now carried out by the Union,—a combination of parishes,—but the overseers continue to be appointed by each parish. It is customary to levy all rates according to their assessment, and it is as a rating area that the parish is most important.

The ancient assembly of the parishioners was held in

¹ Those readers who take an interest in the history of English local government would find it to their advantage to read Lawrence Gomme's *Principles of Local Government*. The author acknowledges with gratitude his indebtedness to this work for some of the information contained in this chapter. Among other works which he has consulted with advantage are Blake Odgers's *Local Government*, *The Municipal Year Book*, published by Lloyds, Fleet Street, and Dolman's *Municipalities at Work*.

the priest's robing room, whence its name—"the vestry." In course of time some parishes became very large, and it became customary to depute a small body of men to attend to parochial affairs. Such a body was called a "select vestry"; in some cases it filled vacancies by itself choosing new members, in others it was re-elected at intervals. In this last case electors who contributed largely to the rates had more votes than those who contributed little. In all vestry meetings the parish clergyman had a right to preside.

The vestry continued to be the parish authority until 1894, in which year its powers, with the exception of those relating to the church and to ecclesiastical charities, were taken from it in rural parishes. In urban parishes it still remains to control the parish property and ecclesiastical or other charities, except in London. There it acted for parishes and "hamlets," some of which had a quarter of a million of inhabitants, until 1900, when, after many reformations, it was at last abolished.

The rural parish is now governed by either a parish meeting, *i.e.* an assembly of all the parochial electors, or else by a parish meeting and a parish council. In parishes with a population of less than three hundred—about half our rural parishes are as small as this—there is generally no council. If there is no council a parish meeting must be held at least twice a year; but, otherwise, once a year suffices. All parish meetings are held in the evening, so that labouring men may attend.

The powers of a parish which has no council are not so extensive as those of one which has; but there are certain powers common to both. Of these the principal are to light the streets and provide protection against fire, to provide public baths, wash-houses, and swimming ponds, recreation grounds, and burial grounds.

The parish council consists of a chairman and not less than five nor more than fifteen members. It is elected for three years. Women have votes at its election and may be members of it. Unlike the vestry, it chooses its own chairman, and in its choice it is not limited to members of its own body, but may select any parochial elector. Some of its powers have been already indicated, but it has numerous others—none, however, as yet much exercised. It may hire or purchase land for allotments. Such land may be taken compulsorily if it cannot otherwise be acquired, and if the parish council has obtained an order from the county council enabling it to do so.

Among numerous other powers are some which cannot be exercised without the consent of the parish meeting. It cannot, for example, sell land or buildings, nor consent to a highway being closed or turned aside, nor undertake works involving a rate of more than threepence in the pound, nor raise a loan without the consent of the parish meeting.

2. The District, Urban or Rural

There are certain powers for the proper exercise of which it is felt that the parish is generally too small and the county too large. For this reason new areas have been formed from time to time by grouping and dividing parishes, and new authorities created to act within such areas. Thus were formed new authorities for poor-law administration, for the maintenance and control of highways, for the carrying out of the Public Health Acts, for the laying out of burial grounds, and for other purposes. As a rule the areas within which such bodies acted were formed without regard to the boundaries

of boroughs and counties, and indeed without regard to the boundaries of any other local authority whatsoever. Local authorities existing for one purpose were elected or appointed in one way, and those existing for another purpose were elected or appointed in another way. Every petty board levied its own rate. Into the confusion thus produced the legislature endeavoured to introduce order by the Local Government Act of 1894. The ideal aimed at in that Act was apparently that of a system of local government under which each county would be divided into convenient areas, each formed of a group of parishes, and with an authority acting within it for all those purposes which were not performed either by the parish or by the county itself.

Under that Act every county is divided into districts, each of which is governed by a district council. The districts are divided into two classes—urban and rural: wherever a town exists the area on which it stands has been constituted an urban district, in the formation of which little regard has been paid to the boundaries of those parishes on parts of which the town population has grown up. All other districts are rural. There are now about eight hundred urban districts, apart from boroughs, and between six and seven hundred rural ones. Boroughs, it may be stated, have all the powers of urban districts, but they constitute another class of administrative divisions.

The populations of county districts vary greatly, but much less than those of parishes. In the neighbourhood of London and other large towns there are districts with populations of fifty or sixty thousand, in the thinly settled parts of the country there are others with populations of only a few hundreds; but such extremes are quite exceptional. There are but few urban districts

whose populations fall below two or three thousand, and, except boroughs, not many with populations exceeding from ten to fifteen thousand.

The number of members of a district council is greater or less according as the population of the district is larger or smaller; there must be at least one member for every parish with 300 inhabitants. The council sits for three years, and meets once a month, or oftener if occasion requires. It elects its own chairman, and may choose any one who is qualified to be a member of the council, whether he has been elected to it or not. Women are under only one disability with regard to district councils. They may vote at the election of members, or sit as members, or be chairmen, but whereas a man if chosen chairman is entitled to be made a justice of the peace, a woman so chosen has not this right.

The powers, duties, and liabilities of the authority thus created vary somewhat. If a rural district consists of only one parish, the district council performs all the functions of a parish council as well as those proper to itself. In urban districts there are of course no parish councils, and in them the district council may obtain, by application to the Local Government Board, any powers of a parish council which it may think would be useful to it. Beyond the distinctions thus introduced there are others due to the fact that the powers of an urban are wider than those of a rural council.

Among the more important of the numerous powers and duties of a district council are those connected with the care of the public health. It owns and controls the sewers, and may maintain works where sewage shall be deodorised or destroyed. It can compel the owner of any house situated within a hundred feet of its sewers to drain into them unless the house is already efficiently

drained. It regulates the carrying on of offensive and noxious trades. It compels owners of houses which are in a filthy condition, or where there has been infectious disease, to whitewash and disinfect them. It has powers to destroy infected clothing. It provides hospitals for persons suffering from infectious disease. For this purpose two or more district councils frequently combine. It provides a mortuary. It regulates cellar dwellings and common lodging houses. It can compel the owners of insanitary house property, or buildings which obstruct the access of light and air to dwellings, to repair the objectionable property, or pull it down, as the case may require. In place of houses thus demolished, or simply because there are not enough houses for the people of the district, it may erect houses itself.

The district council has powers in connection with water supply. In an urban district these are of a rather permissive character. The legislature appears to assume that private enterprise will generally be sufficient to ensure a proper supply of water in populous neighbourhoods, but in rural districts it is made part of the duty of the district council to see that every house has a proper supply of water. In practice, however, it is extremely difficult—indeed it is impossible—for the district council to perform this or any other of its duties in face of the opposition of the parish which would have to bear the expense.

The district council is the chief authority for the control of highways. It usually maintains and repairs them all except such field footpaths as a parish may elect to take care of. The expense of maintaining main roads and bridges is borne by the county council, which may, if it thinks fit, do this work itself. A great deal

of friction results in the endeavour to adjust the burdens of these dual authorities, and it is said that district councils do not by any means keep the roads which their district pays for up to the same standard of excellence as they do main roads. The district council has also the duty of preventing encroachment on the strips of waste land which lie alongside the roads.

Every district council has power to acquire land for allotments.

This is by no means a full list of the duties and powers of a district council: it will, however, indicate the nature of the principal ones.

It should be added that the urban council has many other powers and duties which do not pertain to the rural. It regulates the width and paving of streets. It cleanses and lights them. It may provide gas to private consumers, if there is no gas company already doing so, or if it has bought such company's rights. Finally, it has power to provide among other things markets, museums, gymnasiums, public libraries, baths, wash-houses, recreation grounds, cemeteries, and crematoria. It must not, however, be supposed that every district council makes a full use of its powers. Most of them do not. Nevertheless these bodies are much more active than the parish councils — especially is this the case in urban districts.

There is an important difference to be noted between the financial arrangements of the urban and the rural district councils. The urban district council meets its expenses chiefly by a rate levied over the whole of its area, whereas the rural district charges each parish for any service it renders it in sewerage, water supply, etc. This circumstance largely explains the backwardness of country villages in availing themselves of the advantages

which the Act might confer upon them. An expense which would seem trivial if spread over a large area with a high ratable value, becomes prohibitive when the area is small and the ratable value low.

3. The Port Sanitary Authority

Besides the district councils above described there are sixty port sanitary authorities, with powers over the waters of a port and some parts of the land surrounding. Sometimes a town council is the port sanitary authority, but more frequently there is a joint committee of representatives of the town and of people specially interested in the port, such as shipowners.

4. The Union

The law provides that every destitute person shall have his necessities relieved. This has been so since the days of Queen Elizabeth. The duty of relieving destitution was at first laid upon the parish, but in 1834, when a series of drastic reforms were made in the law and in its administration, which had at that time become exceedingly lax, among the many changes which were made was the combining of parishes, except a few very populous ones, into groups. To these groups, and also to the parishes left uncombined, the name of "union" was given. There are about 650 unions.

Every union is governed by a Board of Guardians. In urban parishes guardians are elected by the parochial electors, but in rural ones the district councillor represents his parish. The Board thus formed may, if it thinks fit, add to itself two additional members, as also a chairman or vice-chairman, from among those

qualified to be guardians. Women are under no disabilities either as regards the election of guardians or the holding of office.

The duty of the guardians is to provide relief for destitution. In the case of able-bodied men they may give relief only when the applicant has been set to perform a task of work. A workhouse is maintained where work is provided, but the place is much more than its name implies. It is a place where the recipient of relief is maintained under rigid discipline, and, except when a period of exceptional distress results in the workhouse being overcrowded, no able-bodied man receives any relief unless he is willing to reside in the workhouse.

The problem of finding a task which should neither be a useless and degrading waste of energy, nor yet produce a commodity to be put upon the market, and so deprive people outside the workhouse of their means of living, is an exceedingly difficult one. Very few Boards of Guardians have even attempted to solve it. The work given usually consists in breaking stone, picking oakum, grinding corn in a hand-mill, etc. When the task is not of this nature it will commonly be the chopping of fire-wood, or the making of mats, or some other simple occupation. The goods so produced are sold in competition with those produced by the labour of other people. Under the most favourable conditions the wages of these people would be low; the workhouse competition lowers them still further. Moreover, it throws some of them out of work. Thus the law which was intended to relieve distress is caused to create it.

There are, however, one or two unions where the guardians have found a more excellent way. There the task consists in cultivating a garden which provides the

inmates of the workhouse with vegetables and fruit, and in cleaning, painting, and other work in connection with the workhouse itself.

In some unions it is the rule to refuse relief even to those who are not able-bodied men unless they will come into the workhouse; but in rural places, and to some extent in towns, it is usual to give a weekly dole to people who are old, sick, or infirm, and to widows with young children.

Guardians provide hospitals, or, as they are called, "infirmaries," for sick people. For this purpose rural unions frequently combine. Another purpose for which they commonly combine is the maintenance of industrial schools, where the children under their care are maintained, and where each child learns a trade. This method of rearing children has, however, been much discredited of late years, and boarding out and cottage homes are being resorted to instead.

There is one function which might be considered to pertain to the relief of destitution which is not performed by the guardians: the maintenance of asylums for lunatics, whether pauper or otherwise, has been entrusted to county councils,¹ perhaps because the parish union was much too small an area to maintain a lunatic asylum. On the other hand, guardians have duties in no way connected with the Poor Law. Among others they appoint the registrar of births and deaths, and they administer (sometimes very unwillingly) the Vaccination Acts.

¹ This does not apply to imbeciles or feeble-minded people who may become chargeable to the rates, but only to lunatics.

5. The School District

The theory that the State has a right and a duty to insist that all children shall be educated, and that it should itself maintain schools for the purpose, is one of which even yet it can hardly be said that it is unreservedly accepted in England. The movement in favour of State education began in the first years of the nineteenth century, but the struggle between the Church, which in earlier times had had entire control of education, and other bodies, which had more recently come to take part in the work, postponed the triumph of the idea for many years. It must not, however, be supposed that during the long interval the State stood altogether idle. In 1832 it began a system of granting money to the bodies which built and maintained elementary schools, but the sum was at first ridiculously small—only £20,000 per annum, and, as it was given without proper safeguards as to its right expenditure, much of it was wasted or misapplied. In 1839 the grant was increased to £30,000, and a department of State—the Education Department—was created, which appointed inspectors to examine and report upon schools accepting the State aid. From this time onwards the annual grant of money continually increased, while the conditions under which a share of it might be obtained were from time to time altered or elaborated. As the result, ever larger numbers of children were brought into the schools, and the education there given was on the whole improved. Nevertheless a very large part, perhaps the majority, of the people grew up illiterate. This was a deplorable state of things, and repeated efforts were made to pass an Act of Parliament which should establish a system

of universal State education. All such efforts were foiled by the contentions of religious factions, until at length, in 1870, a compromise was arranged, and the Act passed which is the basis of our present system of national education, but is at present (1902) under reconsideration in Parliament. Under this Act and subsequent amending Acts, it is the duty of every parent to see that his child receives an elementary education, and the State undertakes that a school shall be provided within a reasonable distance where that education may be obtained, and that without fee. As to religion, while the parent may not insist that his child shall be instructed in the views which he himself holds, he may, if he thinks fit, withdraw his child from religious instruction altogether.

In order that schools may be provided and the Education Acts carried out, England and Wales have been divided into school districts. Every borough is such a district: outside boroughs the district is either a parish or a group of parishes. Within every such locality either a School Board or a School Attendance Committee has authority.

School Boards exist for about two-thirds of the country. Their funds come, in some cases, to a small extent from fees; but they are mainly derived from Government grants and from the rate which every School Board levies.

6. The County

The county like the parish is an ancient and historical division. Our Anglo-Saxon forefathers came to this country as tribes; and, though all these tribes were ultimately brought under the rule of one king, each still retained a measure of independence within the territory which it had conquered and settled for itself. Upon the model of these tribal communities other administrative areas were formed in lands subsequently conquered from the Britons or reconquered from the Danes.

South of the Thames and the Bristol Channel all the counties except Cornwall represent original Teutonic settlements,—in the east kingdoms, in the west *gås* or territorial divisions of ancient tribes. Of these tribes two at least, Freeman has pointed out, still retain the ancient tribal names, the counties of Dorset and Somerset being equivalent to the settlements of the *Dorsætas* and *Sumorsætas*. On the other hand, in the English midlands the counties are shires strictly so-called—districts formed after the reconquest of the country from the Danes by the shearing or dividing up of a territory whose old tribal divisions had been wiped out. These new divisions were all grouped round a central town, which in nearly every case gives name to the new county, and which originally was the seat of a castle forming the centre of administration for the division. “All the Mercian shires save Shropshire and Rutland are called . . . after a town.”

But whatever may have been the origin of the counties, the nature of the physical features still marks out in many cases the determining causes of the boundaries. In other cases, however, former conditions must be taken

into account before these boundaries can be understood. In all cases, it must be supposed, the boundary line, where not formed by a well-defined natural line of separation like a river, was most likely to run through thinly peopled tracts separating denser aggregates of population. Hence in the higher parts of the north of England the county boundary runs in many places along a high water-parting, and is just as appropriate now as it must always have been. It is noteworthy, however, that where Yorkshire and Lancashire adjoin, the boundary in that tract where the valleys of the Aire and the Ribblè are brought so near together at an elevation under 500 feet in height (see above, p. 79) does not run along the water-parting, but crosses the Ribble and runs along the top of the outlying portion of the Pennines (pp. 87, 88) between the Ribble and the Wyre. In this we have another illustration of the ancient preponderance in this part of England of the east over the west (see above, pp. 89, 90). The great body of the population of this region was formerly in the vale of York, and the population thinned out thence up all the valleys to their heads, and in this case even beyond. A more striking anomaly is Westmorland, which contains, besides Kent-dale (Kendal), the upper parts of valleys (the Lune and the Eden, with the Petterill) on opposite sides of Shap Fells.

In the south of England it is the exception for the low hills which are there found to mark in any way county boundaries. The most noteworthy instance of a range of hills doing so is to be found in Edgehill, along which winds the boundary between Warwickshire and the counties of Northampton and Oxford. On the south-west of Somerset also, the boundary runs along the bleak Blackdown Hills, and thence to Exmoor, where it runs from south to north across the dreariest part of that

moor, so as to separate the population that have advanced from east and west round the ends of those high grounds. The Chiltern Hills run right through Buckinghamshire, the valleys running through those hills, as above described (p. 103), being more effective as forming means of communication between the populations on opposite sides, than the higher grounds are as barriers, whereas a much more effective separation between different populations was formerly constituted by the marshes of the Colne, the natural boundary on the west of Middlesex. The common meeting-place of Surrey, Kent, and Sussex is in the middle of the formerly unpeopled forest of the Weald.

In the heart of the former kingdom of Mercia lies a county, Staffordshire, whose present dumb-bell distribution of population is strikingly at variance with the account here given of the natural position of boundary lines; but there is not the slightest doubt that the dense populations of North and South Staffordshire are of comparatively recent origin. The first centre of this district, Lichfield, —situated, as has been already shown, near an important point of convergence of Roman roads,—was succeeded by Stafford on account of the commanding eminence, which offered a site for a strong castle, and from that centre the population originally thinned away towards the north and south even more probably than to the east and west. Another midland boundary is remarkable—that between the counties of Warwick and Leicester, which is for the most part characterised by a straightness which at once catches the eye. The boundary here is in fact part of the old Roman Watling Street, and as such might have been expected to run through rather a populous tract of country. There can be little doubt, however, that this was not the case. The borders of this old highway are still but scantily peopled, and in Roman and Anglo-Saxon

times the road probably led through dense forest serving only to connect distant stations, the nearest aggregates of population on opposite sides of it till long after being those round Leicester and Coventry. For a boundary in such a region the road had the advantage of forming a well-defined line. As a county boundary this road is unique, but there are numberless instances in which similar advantage has been taken of a Roman road to mark the parish boundary.¹

In Anglo-Saxon times every shire had an assembly called a "shiremoot," composed of all the principal land-owners and of representatives from the hundreds and townships. This assembly had both legislative and judicial powers. Under Norman influence the shire was more and more subordinated to the State, until, in the reign of Edward III., judges, appointed by the king and acting within the whole of England, took over all the more important powers of its moot; while the less important powers were transferred to justices of the peace, acting within the county only, but, like the judges, appointed by the king. Thus modified, the county was, at a later date, introduced into Wales.

The justice of the peace continued for centuries to be the county authority, while many new duties were laid upon him, and some old ones became obsolete. At length, in 1888, an Act was passed which left him still to perform his judicial functions, but placed his administrative work in the hands of newly-created county councils.

Of these county councils some ancient counties have

¹ For a very interesting exposition of the subject of administrative boundaries, both civil and ecclesiastical, see Mackinder's *Britain and the British Seas*, pp. 201-230; and also Freeman's *English Towns and Districts*, pp. 110-123, as well as his article on England in the ninth edition of the *Encyclopædia Britannica*.

more than one, so that there are sixty-three administrative counties, though only fifty-two judicial ones. Even where the ancient counties are undivided, their boundaries in most cases do not coincide with those of the modern administrative counties. It should be added that most boroughs have some of the powers of a county, and some have nearly all.

The chief officials of the judicial county are the sheriff, whose main duties are to summon juries and enforce judgments of the High Court, and the lord-lieutenant, who commands the county militia, and usually fills also the office of *Custos Rotulorum*—keeper of the county records. Both these officials are appointed by the Crown. Every county has also a number of coroners. The coroner's principal duty is to hold an inquest whenever a person has died in prison or by violence or accident or from an unknown cause. Coroners are appointed by the county council. Lastly, there are the justices of the peace. These are appointed by the Crown. They meet—those who take the trouble to attend—four times a year or oftener, in quarter or general sessions, to hear rating appeals, to try important criminal cases, and do other business. The justices also divide their county into petty sessional divisions, and justices resident in or near each of these divisions hold a court within it at intervals. The principal business done is the trying of charges of drunkenness and other small offences, and the granting of various licenses—notably those of publicans.

In the administrative county the council consists of a number of members varying with the size of the county from thirty or forty to over a hundred. Women may vote at its election, but may not be members. One-fourth of the council consists of aldermen chosen by the other

members, sometimes from among themselves, but more frequently from outside.

As to its powers, it should be stated that the county council of the Scilly Islands performs every function of local government for its locality, and that London's county council has also special powers. Apart, however, from such exceptional cases, every county council has many important powers and duties. Among others it is responsible for the maintenance of main roads and of nearly all bridges. It maintains lunatic asylums, reformatories, and industrial schools. It organises and assists technical education. It appoints inspectors to see that tradesmen do not use fraudulent weights and measures, and a public analyst to examine samples of food and drugs which have been exposed for sale. It settles the areas and boundaries of its parishes and districts, and has power to establish parish councils in parishes with a population of less than 300, or to group a number of such parishes and establish a parish council for the group.

The county council has also part control of the county police. These act under the orders of a standing committee, one half of whose members are appointed by the county council and the other half by the justices in quarter sessions.

The income of a county council is mainly drawn from the county rate and from subventions from the Treasury, which pays half the cost of the police, provided they are efficient, makes grants for technical education, pays part of the rates to which agricultural land has been assessed, etc.

The county derives from the one source about as much as from the other; but most of the money obtained from the Treasury is redistributed among the parishes and districts within its area.

7. The City or Borough

Most of the large towns of England and Wales, and some of the smaller, are incorporated,—most as boroughs, some as cities; but this is purely a difference in name. The smaller boroughs are generally places which have been important but have declined. No town can now be incorporated with a population of less than 10,000. Many boroughs have ten times this number of inhabitants, and most of these larger ones are continually growing by a process of extending their boundaries from time to time to include the urban districts rising around them. The largest is Liverpool, which has thus grown to a population of nearly 700,000 inhabitants, and an area of over 15,000 acres. And it would no doubt have been further extended to include Birkenhead on the other side of the Mersey, and Bootle, which forms with Liverpool a continuous urban area, but for the fact that these towns are incorporated themselves.

There are over 300 boroughs. They are found in every part of the country, but of course they are much more numerous in the manufacturing districts than elsewhere.

As an institution the borough is of such extreme antiquity that as far back as records take us we find it already in existence. Some arose on the sites of Roman camps and cities, and it may be that the continuity of civic life and institutions in some of these has never been entirely broken. Others developed from Saxon townships favourably situated for purposes of trade; others arose in the feudal era under the sheltering walls of a castle or an abbey. Many existing boroughs have some such history, but most are the result of the great concentration of population which has

taken place during the past century; and the government of all alike—the most ancient as well as the most modern—is now regulated by a series of Acts of Parliament, of which the earliest was passed in 1835, and the latest so recently as 1888.¹ The charters and privileges of the ancient boroughs have not been altogether superseded, but the institutions which have survived are unimportant.

As the result of these Acts any man, spinster, or widow, who pays rates within the borough and resides within seven miles of it, is entitled to be enrolled a burgess. From among the men who are thus enrolled, mayor, aldermen, and councillors are chosen. The number of councillors varies with the size of the boroughs; in some cases there are only twenty-four, in others four times as many. There are one-third as many aldermen as councillors. The councillors are elected by the burgesses, and themselves choose the aldermen and mayor, usually taking them from among their own number. Councillors sit for three years, aldermen for six, the mayor for one. The elections take place in November. Most local government elections take place in the spring.

The whole body of mayor, aldermen, and councillors is called the borough council. It usually meets once a month. Its work is nearly all done through committees.

The powers of the council embrace all those which have been previously described as pertaining to an urban district council, but there are usually many others. Nearly every borough does things for itself which, outside of boroughs, are done by the county, and most large

¹ The Act constituting the Metropolitan Boroughs was passed in 1899, but these are separately treated elsewhere.

boroughs have also a great number of powers which they hold under special Act of Parliament.

With regard to those powers which make the borough more or less independent of the county, boroughs differ very greatly among themselves. Some perform such functions as belong to the judicial county, some those of the administrative county, some have the functions of both. Thus many boroughs have magistrates appointed to supplant the county justices in Petty Sessions, *i.e.* a magistrate with power to deal with small offences and to issue licenses for the sale of alcoholic liquors; others have a magistrate called a recorder, who exercises within the borough powers similar to those of justices in quarter sessions. Such magistrates are paid by the borough, but, whether paid or not, all borough magistrates, except the mayor (he is a magistrate while in office and for one year afterwards), are appointed by the Crown. Some boroughs elect a coroner. There are nineteen which, in addition to all the powers just described, elect their own sheriff. Such boroughs are called counties of cities or counties of towns. For judicial purposes they are entirely independent of the county or counties around them. Most large boroughs have their own police forces, controlled by a "Watch Committee," which the council appoints. Finally, there are sixty-four county boroughs whose borough council exercises nearly all the powers of a county council. This last class was created by the Act of 1888. It consists mainly of large towns, but includes a few relatively small ones which were already counties of cities, and which the Legislature was unwilling to deprive of their ancient independence of the county.

If a town is both a county borough and a county of a city, it is entirely independent of the county except

for military purposes. Beneath this degree of independence there is every possible gradation—*e.g.* most counties of cities are county boroughs, but some are not; a few county boroughs are counties of cities, most are not; most county boroughs have their own quarter sessions, but not all; nearly all have their own police, but there are exceptions even to this. Similarly, with boroughs which are neither counties of cities nor county boroughs, the amount of civic independence possessed by some is greater than that of others. Speaking generally, the larger the town the more rights and privileges it has; but antiquity counts for a good deal.

Lastly, we must consider the powers which boroughs hold under special Acts of Parliament.

As a town develops it becomes conscious of new needs. The markets are no longer large enough for the number of people who must use them; a larger and ever larger supply of water is needed; the town requires open spaces in which its crowded inhabitants may breathe a purer air; it feels that it must demolish the rookeries into which necessity has driven its poor, and provide decent homes for the people at rents they can afford to pay. It needs public baths, a library, an art gallery, and a museum. Its burgesses naturally desire that the profits on its tramways and its lighting should go into the corporate purse—not to enrich individuals. The overcrowded graveyards menace the health of the living. Boroughs have powers in connection with some of these matters under public and general Acts of Parliament; but, apart from the fact that some of these Acts have only recently been placed upon the statute-book, there is the further fact that most municipalities prefer a private Act meeting their special requirements and giving them powers which the public Act does not.

Thus in some cases under general Acts, in others under private Acts, local authorities have undertaken services of the nature indicated, which have already attained the highest importance, and which are continually growing. At the present time forty-five county boroughs obtain their water from their own or a neighbouring public authority; and as for the non-county boroughs, their water is thus supplied in nearly every case. In like manner, though in less degree, with gas, and about half the boroughs which supply gas supply also electricity for light, and in some cases power. There are many others which supply electricity, though not gas. Indeed the supply of electricity, being a new industry, which has developed contemporaneously with the recent awakening of the municipal spirit, has already passed largely into the hands of local authorities, and promises shortly to be almost entirely under their control.

As to tramways, the law since 1870 has encouraged their municipal ownership; but until 1896 it prohibited their municipal working; they were all leased, except one or two, where no company would take up the enterprise. At the present time some sixty or more boroughs own tramways—about half of them working the tramways themselves; and there are numerous other towns which are actively engaged in acquiring or constructing tramways. It may be remarked in passing that there is a growing tendency for the authorities of contiguous localities to combine to form a joint tramway system.

The housing problem has also engaged the attention of many boroughs. Although it can hardly be said that there has been anywhere an attempt to solve it, nevertheless over forty boroughs have displayed a certain amount of activity, and, so far as they have gone, have done excellent work.

Finally, most boroughs and cities have parks, more than half have public libraries, and a few have art galleries and museums. The gifts of wealthy citizens have sometimes helped in the acquisition of all these.

A brief account of the work undertaken by the two largest municipalities will serve to show what is the nature of the municipal services which an enterprising borough renders to its inhabitants.

Liverpool is, as has been stated above, the largest of English provincial cities, its population being nearly 700,000, and its acreage over 15,000. The houses, land, and other property on which its rates are levied are assessed as being worth about £4,000,000 per annum. It is an ancient city, and its present corporation inherited an estate in city lands, out of the revenues of which Liverpool's public buildings have been largely erected, and which now brings in a revenue of about £100,000 a year.

Liverpool owns its eight markets; the profits relieve the rates to the extent of about £17,000 a year. It owns its own water-works, and supplies also the neighbouring borough of Bootle and the country districts around,—the population, which is wholly or partly dependent on its water-works, numbering nearly a million. It first acquired water-works more than half a century ago. These it enlarged and extended, but the town grew until they were altogether inadequate. To supplement them, and to provide for the future, a great work was undertaken. In the north-west of Montgomeryshire, in the upper part of the valley of the Vyrnwy, the superficial configuration allowed of a lake being formed by building a dam across the narrow outlet of the valley. This was done. The dam is of solid masonry about 1200 feet long. The body of water it holds

back is $4\frac{1}{2}$ miles long and half a mile wide; it covers more than 1100 acres, and its available contents amount to more than twelve thousand million gallons. It is considerably larger than either Thirlmere or Loch Katrine, from which the cities of Manchester and Glasgow draw supplies of water, though both these natural lakes have been artificially enlarged since they have been used as reservoirs. From Lake Vyrnwy 13,000,000 gallons of water are now taken daily, in addition to the 14,000,000 obtained from the old sources of supply. The water is brought to Liverpool by an aqueduct 67 miles in length. Its quantity could be increased if need arose to as much as 40,000,000 gallons a day.

Liverpool does not own gas-works, and it has owned its electric supply only since 1897. The use of electric light is rapidly extending. At present there are about 240,000 eight-candle-power lamps connected with the mains. Great extensions of the works are at present being carried out to enable the Corporation to provide electric power for the tramways.

As to these, Liverpool made its first purchase of tramways in 1879; but of course the lines were leased. It began to work its tramways in the same year as it acquired the electric supply. It now owns and works about 63 miles of tramway, of which about 14 miles are worked by electricity. As indicated above, electric traction is to be extended to the whole.

In the poorer parts of Liverpool the houses seem to be even more insanitary and over-crowded than is usual in our great cities; and the death-rate is consequently very high. The corporation has, however, done somewhat to clear away rookeries and to widen courts and alleys, and it has built about 400 tenements of from

one to three rooms each. The rents for these vary according to the number of the rooms and to the floor on which the tenement is situate. A three-roomed dwelling on the first or second floor lets for five shillings and sixpence a week.

Liverpool established its first baths and wash-houses so long ago as the year 1794. To-day its baths are more extensive and more varied than those of any other city in the country. Every year there are about 1,000,000 bathers, and 200,000 women use the wash-houses.

Rich collections are to be found in the art galleries, libraries, and museums of the city. The Walker Art Gallery, opened in 1877, contains a large number of fine pictures, to which examples of the work of contemporary artists are continually being added. An attendance of about half a million visitors a year shows that the gallery is appreciated. The city has also an excellent reference library (the gift of Sir William Brown, opened in 1864), a reading-room (the Picton Reading-Room) for popular reading, where fiction, magazines, newspapers, etc., are provided, other three reading-rooms, open in the evening, and six lending libraries.

Liverpool has several parks—one covering 270 acres.

The list of services above indicated is a long one; but Manchester has shown an even greater enterprise and activity.

Manchester itself is a city of less than 550,000 inhabitants, and its area is under 13,000 acres; but it is the centre of a series of connected townships, many of which take part in the great municipal institutions which it has developed. Thus the Manchester Corporation supplies gas to a population of 700,000, and water to over 1,000,000.

Manchester owns its markets and slaughter-houses.

It has fifteen markets altogether, and they yield annually a surplus of £16,000 or £17,000 in relief of the rates. It has owned its water supply since 1847. The quantity of water supplied in those days was miserably insufficient, and the City Fathers set to work almost at once to obtain a better supply. About 30 square miles of land, including and surrounding the valley of Longdendale in the Pennine Hills, was purchased, and here were established the works which still supply the city with most of its water. The Longdendale storage reservoirs now cover over 500 acres, and hold above four thousand million gallons of water. But before these works had been developed to their present extent, it had become apparent that an even greater scheme was necessary, and this induced the Corporation to undertake its works at Lake Thirlmere. The area of the watershed here purchased does not greatly exceed one-half of that at Longdendale, but owing to a heavier rainfall it will supply a larger quantity of water. The works include an embankment 857 feet long, and at its highest point 104 feet high, which is to raise the level of the lake by 50 feet, thereby increasing its area from 330 acres to 793, and multiplying its storage capacity manifold. The water is conveyed to Manchester along an aqueduct 96 miles long. When the works are completed, Lake Thirlmere will supply fifty million gallons of water a day for 160 days, even if no rain should fall during all that time. At present there is but one line of pipe laid along the aqueduct, and this can carry but ten million gallons of water a day. Another pipe to convey twelve million gallons of water a day is now (1901) being laid, so that it should be stated that the Manchester Corporation was the first to supply its citizens with hydraulic power.

Manchester has owned its gas supply since 1824. It

now supplies not only itself but sixteen surrounding townships. The length of gas mains laid is more than 800 miles. There are over 120,000 private users of the light, and upwards of 17,000 public lamps. The daily consumption of gas varies from 7,000,000 cubic feet in summer to 26,000,000 cubic feet in winter. The sums paid over in aid of rates average about £50,000 per annum.

Manchester has supplied itself with electric light since 1893, and now supplies some of the neighbouring townships. The demand for the light is continually growing and new works are at present (1901) being constructed. Electricity is to be introduced as the motive power of the tramways, which are also municipal property, and which also extend beyond Manchester's boundaries.

To improve the housing of the people the Corporation has, for some years past, been clearing away back-to-back houses and other insanitary property. In partial replacement of these it constructed blocks of tenements, and has purchased land in a suburb for erecting cottages. It has also erected a lodging-house which will accommodate 363 persons. Half-a-crown a week is charged for a one-roomed tenement, five shillings and sixpence for a two-roomed tenement or for a cottage.

The city has nine sets of baths, and the bathers number annually over 900,000. It has had public libraries for nearly half a century. It has a reference library of 110,000 volumes, where the daily issue averages on week days about 1300, and on Sundays 205. It has twelve lending libraries, and an even greater number of reading and news rooms. It has an art gallery and a museum.

The disposal of refuse is an enormous business. It would be so as a matter of course in any city of equal

size; but in Manchester it is swollen by the fact that it includes the dealing with a great deal of matter, such as is elsewhere passed through sewers; there are nearly 100,000 pail closets and privies in Manchester. The Cleansing Committee of the city's Corporation is charged with the duty of getting rid of the contents of these, as well as with the emptying of dust-bins, the sweeping of the streets, and the dealing with the garbage of markets, the refuse of slaughter-houses, the litter of stables, and so forth. Altogether there are over 1000 tons a week of these various descriptions of refuse, which has to be got rid of somehow or other.

But the Cleansing Committee is not satisfied with merely ridding the city of this unwelcome presence. It uses the refuse as raw material from which to manufacture a number of useful and saleable articles. Mortar, soap, oil, and tallow are in the list, but the most important is an excellent fertiliser, about 7000 tons of which are made every year and sold to farmers and gardeners in the surrounding counties, and to some extent in other parts of England as well.

Since 1886, however, the principal use to which Manchester's refuse has been put has been the reclamation of two extensive tracts of bog, or "moss," as it is called in Lancashire. In the year named the Cleansing Committee purchased, on the city's behalf, the Carrington Moss Estate, a tract of land 1100 acres in extent, of which more than half was "wild" moss—in places dangerous to walk over.

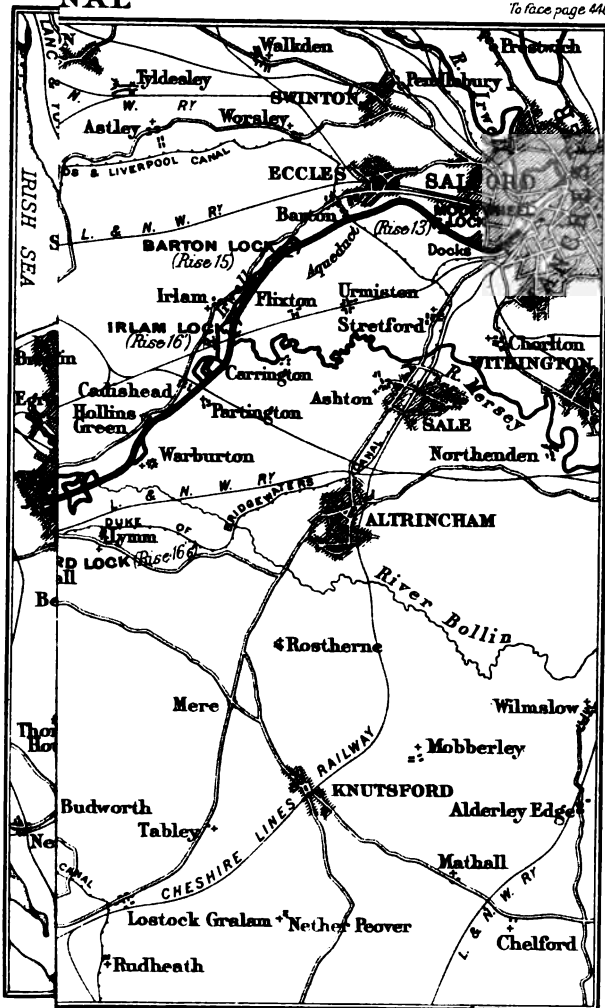
The Committee had this tract of wild moss thoroughly drained, then delved by hand to a depth of about eight inches. Refuse was then dug in to the enormous quantity of 300 tons or more to the acre. After this a crop of potatoes was grown, and then the land was fit to

let to farmers and gardeners, though still capable of very great improvement by the continued application of the refuse, and by cultivation. For some years the Committee retained and cultivated a large part of the moss, selling the crops or using them as provender for its horses; but now the whole estate is let to tenants, though it should be stated that one of these tenants is the Parks' and Cemeteries' Committee of the Manchester Corporation, which has $58\frac{1}{2}$ acres as a nursery.

One of the terms of the tenancy of the cultivators of the moss is that they shall have as much refuse delivered free to them as they are willing to take. But the peat is rapidly converted into good agricultural land by the process of incorporating night-soil, ashes, etc., with it, so that it does not continue always possible to dispose of such enormous quantities of refuse as is the case at first. Accordingly in 1895 the Cleansing Committee found it necessary to purchase the Chat Moss Estate—a much more extensive tract of land than Carrington Moss, though only 200 acres of it were entirely unreclaimed. To these two estates the rubbish of Manchester is now conveyed, and, according to present indications, they will be able to absorb the whole of it for many years to come.

Works of this kind are not undertaken with a view to the realisation of profit on the money invested in them, but because a city must get rid at any cost of matters that would otherwise poison it. It has to be said, however, of this great enterprise of Manchester's that, though the estates do not pay interest on the money spent in purchasing and reclaiming them, the deficit is a small one, and grows smaller every year.

One important factor that has contributed to this happy result is that the estates are not many miles from



Stanford's Geograph. Estab. London

Manchester, and that the refuse can be taken to them by the ship canal. This reduces the cost of carriage to the minimum. If the city had to send daily its 1000 tons of refuse a long distance by railway, the cost of disposing of it might easily be doubled thereby.



MANCHESTER SHIP CANAL: BARTON AQUEDUCT
CLOSED AND IN THE ACT OF OPENING.

Mentioning the ship canal reminds us that though this is not a municipal enterprise entirely, it is so in a large degree. It could never have been finished but for money advanced by the Manchester Corporation, and among the conditions upon which

the money has been so advanced is one that the Corporation shall appoint a majority of the directors of the Canal Company.

8. London

The local government of London is radically different from that of any other urban area. The vast town has presented itself as a unique phenomenon to the legislator, and has been dealt with in a special manner.

Until 1855 there was no central authority of any sort exercising even the most ordinary functions of municipal government over the whole metropolitan area. Every parish, hamlet, liberty, etc., was independent. The absolute necessity for a uniform system of main drainage compelled, in 1855, the establishment of the Metropolitan Board of Works, which lasted until 1888, when the area it governed was made a county, and the Board was superseded by the London County Council.

The county of London covers an area of 118 square miles, and has a population of four and a half millions. It does not include the whole of the urban area which has grown up around the ancient city. The boroughs of West Ham and Croydon and a number of thickly populated urban districts are outside its boundary. Its ratable value is over £37,000,000 per annum.

Previous to November 1900 the principal authorities for local government—apart from those which administered the Education Acts and the Poor Law—were the county council, the city Corporation, and a great number of vestries governing parishes, and district boards governing associations of parishes; but since that date all London outside the city has been divided into twenty-eight Metropolitan Boroughs,¹ each of which

¹ The names of these boroughs are Battersea, Bermondsey, Bethnal Green, Camberwell, Chelsea, Deptford, Finsbury, Fulham, Greenwich, Hackney, Hammersmith, Hampstead, Holborn, Islington, Kensington,

is governed by mayor, aldermen, and councillors. The powers and duties of these authorities are substantially those of urban district councils elsewhere, except that the county council has, besides its powers and duties as a county, certain municipal functions of a sort that must be under central control. The control of main drainage, the provision of parks, and the maintenance of the fire brigade are examples.

The London County Council has these special powers, but, on the other hand, it does not exercise any degree of control over the London police. The county of London outside the city is included in the Metropolitan Police District. This is a large area, the police of which is as much a government force as a local one, and is under the direct control of the Home Secretary.

The ancient city of London covers little more than a square mile of land, and its resident population is only 30,000. It is governed by institutions which have survived with modifications from the Middle Ages,—its principal authorities being the Lord Mayor, Aldermen, and Common Council. It has its own sheriff, its own police, its own courts. It maintains the bridges which connect it with South London. It maintains most of the London markets and takes the tolls. It maintains certain open spaces, such as Epping Forest, which are outside the county of London altogether. Except for purposes of main drainage, the London County Council has little or no jurisdiction within the city area.

For the administration of the Poor Law the parishes of London are grouped into thirty-one unions, the city

Lambeth, Lewisham, Marylebone, Paddington, Poplar, St. Pancras, Shoreditch, Southwark, Stepney, Stoke Newington, Wandsworth, Westminster, Woolwich.

being one. There is a body, called the Metropolitan Asylums' Board, which acts for the whole of London, and maintains asylums for imbeciles, training schools for children, and hospitals for cases of infectious disease. Its members are partly elected by the Boards of Guardians, partly nominated by the Local Government Board. London spends every year on poor relief and other matters connected with the Poor Law more than £3,000,000.

The London School Board has also some peculiar features. It consists of fifty-five members, for whose election the metropolis is divided into eleven divisions, each such division returning from four to seven members elected by cumulative vote. The London School Board spends annually about two and three-quarter million pounds. The average daily attendance at its schools is over 420,000.

The rates for central bodies, such as the County Council and the School Board, are, of course, levied equally over the whole London area. An attempt has been made also to equalise the rates levied by the subordinate local authorities. For this purpose a rate is levied by the County Council over the whole of London, and distributed among the smaller areas in proportion to their population. The result is that the poorer localities have their rates relieved by money obtained from the richer ones. Even so there are great inequalities, the poorer districts being always much more heavily rated than the richer. The total cost of London's government is well over £13,000,000 per annum. Its total debt is nearly £46,000,000.

As to the municipal provision of markets, water-works, and gas-works, circumstances have not favoured this in London. Besides the markets owned by the

City Corporation there are two—and these are two of the largest—in the hands of monopolists. Then there is a market for fruit and vegetables maintained by the vestry of St. Saviour's, Southwark, an ancient hay market in Whitechapel, and a local market in Woolwich. The supply of water is in the hands of eight companies, which supply London and a large area of the country around. Gas is supplied by three private companies.

Of the 112 miles of London tramways the County Council owns about 70, but of these it works only 25, the rest being leased. On all its lines—those that it leases as well as those it works—it has done somewhat to improve the service, to reduce fares, and to better the condition of the employees. Nevertheless the enterprise is a profitable one to the London ratepayer, for the rent of the lines on lease, added to the net profit of those which the County Council works, does not fall far short of £100,000 per annum. The Council is at present actively engaged in the construction of new tramways and experimenting with electric traction.

At the date when the Metropolitan Boroughs were established about half the parishes which they superseded had provided themselves with baths and wash-houses; free libraries had been about as generally adopted,—the parish which had one of these institutions frequently having both, though this was not always the case. About a dozen of the metropolitan vestries had availed themselves of their powers to produce and supply electricity. Where a number of parishes were combined to form one borough, it sometimes happened that some of these parishes had free libraries or public baths or electric light, but the others had not. Accordingly some of the new boroughs found themselves with public institutions which existed for part of their area, but not for

all. This anomalous state of things still continues, but will no doubt be presently ended.

In the matter of the housing of the people, London has at any rate done better than the provincial cities. True, most of the vestries did little, and the borough councils have not yet existed long enough for an opinion to be formed as to what they may do in this direction ; but the London County Council has carried out several important schemes of demolition and rebuilding. In the case of the notorious Boundary Street area it cleared away 15 acres of unwholesome slums, and has now built over the ground substantial and comfortable dwellings, capable of accommodating about the same number of people as were previously displaced—about 5700. On the site previously occupied by Millbank Prison it is also erecting dwellings for about 4000 people, and recently it has commenced the erection of artisans' dwellings in the suburbs outside its area.

London does not make the same thrifty use of waste products as do some of the smaller urban communities. Sewage, for example, is poured into the sea. Nevertheless some of the boroughs have "destructors," where dust-bin refuse is burned into grit, useful to builders, and slag, to mend roads. Shoreditch uses the waste heat of its destructor to warm a public library, heat the water of public baths, and drive some of the engines of its electric lighting works.

9. Central Control

The various local authorities above described are all subordinate to the Government. The Legislature defines their areas, constitutions, and powers, and there are certain departments which exercise a measure of control

over the acts of the various local assemblies. For instance, no local authority can undertake electric lighting works without the consent of the Board of Trade, or enclose a common without the consent of the Board of Agriculture. The Education Department, by reason of its power to withhold the Government's grant, is able to keep the School Boards up to a minimum of efficiency. The



Frith, photo.

THE HOUSES OF PARLIAMENT AND WESTMINSTER ABBEY.

Home Office exercises a similar control, and in the same way, over county and borough police.

The chief central authority is, however, the Local Government Board. It supervises by-laws made by local authorities, gives them advice if they wish for it, and demands returns and reports. Of these last it publishes an abstract every year.

It has especially large powers over financial matters. Local authorities desiring to raise loans must either have the Board's consent to their doing so, or else obtain a special

Act of Parliament. It audits the accounts of all local authorities except those of the City of London, and of boroughs. If any local authority has spent money on matters which are outside its powers, the Board has power to compel the members responsible to refund the money.

Boards of Guardians are more completely under its control than any other local authority—a control chiefly exercised in the checking of what it considers undue expenditure by the more generous unions.

10. The Administration of Justice

County and borough magistrates have already been spoken of. The other courts of justice are the County Courts, the Supreme Court of Judicature, the House of Lords, and certain local courts of less importance.

For County Court purposes the country is divided into about 500 divisions, which are grouped in fifty-four circuits. In every circuit sits one judge or more, chiefly occupied in hearing claims for debt where the sum at stake does not exceed £50.

The Supreme Court consists of two permanent divisions—the High Court of Justice and the Court of Appeal. The High Court is further divided into three main divisions—Chancery; King's Bench; and Probate, Divorce, and Admiralty. Among minor, but nevertheless important divisions, is one that deals exclusively with bankruptcy, and a "Court of Arches," which administers ecclesiastical law.

The High Court, like the County Court, is a court of first instance, but it hears appeals from the latter court.

Appeals from the High Court are heard by the Court

of Appeal, and from this an appeal lies to the House of Lords. The House of Lords is the highest tribunal.

The Lord Chief-Justice, who presides over the King's Bench Division, is appointed by the Crown. So is the Lord Chancellor. All other judges are appointed either by the Lord Chancellor or by the Crown on his recommendation. He is the nominee of a political party, and when it goes out of power he retires, but all other judges sit for life.

The Supreme Court sits permanently in London; but as all prosecutions and many civil actions are heard in the county where the offence is alleged to have taken place, or where the cause of action has arisen, it divides the country into circuits and sends judges, called commissioners of assize, who go three times a year from county to county throughout a circuit administering justice.

All criminal cases are tried before a jury, who find verdicts as to the facts, the judge stating what is the law. The practice in civil actions varies.

11. Ecclesiastical Administration

For this purpose England and Wales are divided into about 14,000 parishes, the boundaries of which do not now as a rule coincide with those of civil parishes.

Except in London the ecclesiastical parish still has a vestry which meets every Easter, and at other times if necessary. Every parishioner has a right to attend, but very few do so. The vestry makes a rate to provide for the maintenance of the Church, but this cannot be enforced, and the main sources of the Church's revenue are tithes, glebe lands, and voluntary offerings.

The officers of an ecclesiastical parish are ministers, churchwardens, parish clerk, and sexton.

Parishes are grouped into rural deaneries, and these into archdeaneries. Two or more archdeaneries make the diocese of a bishop. There are thirty-four dioceses, the ten northern ones being grouped into the province of York—the rest into that of Canterbury. Over



CANTERBURY CATHEDRAL.

each of these provinces there is an archbishop, of whom the former bears title Primate of England, while the latter is Primate of all England. Bishops and archbishops are appointed by the Crown. The Church is governed by the Houses of Convocation, *i.e.* an assembly of the clergy of each province; but inasmuch as the Church's articles and liturgy, and its organisation as to benefices, are affected by civil statutes, and its discipline falls within the scope of the

Ecclesiastical Courts, the real power of these assemblies is small.

There are great numbers of nonconformists and dissenters organised into various religious bodies, but these associations are not connected with the State.

CHAPTER XXV

SCOTLAND—PHYSICAL CONFIGURATION

1. Broad Relations between the Geology and Physical Configuration of Scotland

IN the chapters devoted to the physical description of England some attention was devoted to the details of the geological structure as influencing the distribution of population, and more particularly the situation of towns and villages. In the case of Scotland this cannot be attempted. For this there are two reasons. In the first place, the geology of Scotland is, on the whole, much more complicated than that of England, so that a consideration of the details under this head would demand too much space. In the second place, with reference to what has been our main point of view, both in the previous volume and the first portion of the present volume—distribution of population and historical development, the influence of geology in Scotland has been of most consequence through the effect it has had on the orographical features of the country. These, therefore, must have our first attention; but it is important to note that the broad character of those features is related in the clearest manner to the dominant features in the geological structure of the country.¹

¹ It should scarcely be necessary to state that the relations between

In the briefest possible manner these broad relations may be stated thus. The north-west of Scotland, including more than half the area, is composed of geologically very ancient, largely crystalline sedimentary rocks, mingled with large patches of igneous origin. The oldest of all these rocks forms nearly the entire area of the Outer Hebrides² or Western Islands, as well as Tiree and Coll in the Inner Hebrides, and are met with on parts of the opposite mainland. The Outer Hebrides are mainly low lying, but rugged, barren, and inhospitable, with rocky, much-indented shores, in many places bordered by numerous rocky islets. On the mainland this ancient area is mainly highland.

Another ancient highland area, known as the Southern Uplands, occupies the south-east of Scotland, but this is, on the whole, geologically more recent than the north-western highlands, and orographically less rugged. A lower and geologically still more recent area, known as the Central Lowlands, intervenes.

2. Coast-line

The whole of the western coast-line of the northern highlands of Scotland is much indented by characteristic rock-sided fiords³ and straits. On the east side there is nothing exactly similar. The only openings having a resemblance in outline are those in the angle of the Moray Firth between Sutherland and Morayshire; but these differ from the fiords of the west in being shallow,

the geography and geology of Scotland are described and discussed in detail in Sir A. Geikie's *Scenery of Scotland*.

² This name originally a misreading of *Hebudes*.

³ See vol. i. p. 29.

with low shores and mouths mostly formed by sand-spits. In respect of this last feature, Cromarty Firth, with the Sutors rising in precipitous brown walls to the height of between 400 and 500 feet at its entrance, is a striking exception; but an examination of the district shows that the original mouth of this inlet was not unlike that of the others, being found in what is now an alluvial flat containing the direction of the upper part of the firth towards the mouth of Dornoch Firth.¹ Where large indentations occur in other parts of the coast of Scotland, they have generally low shores with a smooth outline. Both sides of Scotland are marked by raised beaches, which in some places rise above one another to five in number, at heights of 25, 40, 60, 75 and 100 feet above high water.

3. Glacial Deposits

Every part of Scotland contains extensive deposits derived from the last Ice Age. These are mostly in the form of boulder-clay—commonly a tough hard clay containing numbers of stones of local origin, and generally attaining the greatest depth in the valleys, and thinning off towards the hillsides. Here and there this clay is covered with the sand and gravel ridges known in Scotland as *kames*.² Ancient lake terraces are also now generally recognised as in some cases due to glacial action. In particular, remarkable terraces, known as the Parallel Roads of Glen Roy and Glen Cloy, in the south-west of Inverness-shire, are now generally believed to have been due to the former existence of lakes caused by the damming of the mouths of these valleys through a glacier filling Glen Spean.

¹ A. Geikie, *Scenery of Scotland*, pp. 186-190.

² See vol. i. p. 28.

4. The Central Lowlands

Already, in the paragraphs relating to the boundary between England and Scotland,¹ attention has been called to the main fact with regard to the distribution of population in Scotland—its condensation in the midlands. From a geographical point of view this has been the main factor in Scottish history. Once it was decided by the course of history that Scotland was to form a separate country; it was that fact which in the long-run determined who were to be the dominant people, and what was to be the dominant language in that country. But that process of determination was a slow one. The unification of Scotland was long in being accomplished. The battle of Carham in 1018² has been taken as the most appropriate date for marking the distinction between Scotland and England, as the names are now used. "By the acquisition of Lothian [the region between the Forth and the Tweed] Malcolm II. became nominal master of the country from the Tweed to the Pentland Firth. More than two hundred years were to pass, however, before there was to be a king of Scotland in reality as well as in name."³ Even then the kingdom thus formed was composed of very diverse elements, which remained to a large extent for hundreds of years afterwards mutually antagonistic, but which in matters of the highest importance had a common history, and, even while that antagonism continued, cherished as against the world at large a common feeling, a sentiment of patriotism of peculiar intensity which lasts down to the present day.

•To say that geographical conditions explain all this would be a great exaggeration, but it cannot be denied

¹ Pp. 269-271.

² See above, p. 247.

³ Hume Brown *History of Scotland*, vol. i. p. 49.

that the study of those conditions contributes greatly to the understanding of it.

For that reason we will examine first of all the midland area, in which the bulk of the population of the Scottish kingdom must always have been concentrated. Physically it is a region of great diversity, both in geological structure and in surface features. Geologically it is composed of an intricate arrangement of sedimentary and igneous rocks, but on the whole the area is of more recent date than those which lie to the north and south of it. Superficially it presents an almost equally complicated succession of hills, valleys, and plains, but on the whole it is lower in elevation than either of the bordering regions. Its plains are more extensive, its valleys broader, the hills less continuous and lower, than in the two other parts of the country. From both these latter regions it is marked off at least geologically by well-marked lines running nearly parallel from south-west to north-east.

The northern boundary is geologically for the most part one continuous line of fault, marking off the ancient crystalline rocks of the north-west from the adjoining Old Red Sandstone on the south-east. If we take the line as continued to the coast at both ends, it may be taken as starting on the east at a point a little to the east of Helensburgh on the north shore of the Firth of Clyde, and running thence almost exactly north-eastwards to a point a little north of Stonehaven on the North Sea. It cuts in the extreme south the broader end of Loch Lomond, passes to the west of the mouth of the Endrick Water, cuts off on the north-west or highland side the upper course of the Forth, which emerges at Aberfoyle; the Teith, which issues just below the pass of Leny; the Almond, which finds its way out near the

east by the Ochil and the Sidlaw Hills, the northernmost of the ranges that diversify the Central Lowlands.

The importance of this line as a boundary is enhanced by the fact that at both ends the higher grounds approach so near to the coast. Near Stonehaven the land above 500 feet in height is within three miles of the coast, and farther inland the ground rises rapidly. At the other end the highland tracts approach still nearer to the sea.

5. The Northern Highlands

Though to the north-west of this line the area is mostly one of highlands, a closer examination of the region prevents us from regarding it as a geographical unit. In the first place, it must be noticed that a little farther north the highlands proper recede from the coast on the east side, and that all along that side, from Aberdeenshire round the shores of the Moray Firth, right up to the north coast of Caithness, there is a strip of lowlands of varying breadth and, from different causes, of various degrees of importance. This strip will engage our attention more particularly later on, but here, it may be mentioned, the rocks belonging to the Old Red Sandstone period reappear in extensive areas.

The remainder makes up the true highlands of Scotland, composed of mountains and uncultivable elevated masses, separated by narrow straths¹ or flat-bottomed valleys, or still narrower glens¹ or V-shaped valleys. Everywhere on the west these highlands advance close to the sea, and in many places both on the north and west coast they sink down to the water in precipitous cliffs, whose rugged grandeur is frequently rendered still

¹ Such is the prevailing but not uniform distinction between these names as applied in the highlands of Scotland. See Sir A. Geikie, *Scenery of Scotland*, 2nd ed. p. 157.

more awful by the violence of the Atlantic waves to which they are exposed. This character is uniform for the whole area, which is likewise geologically, in spite of great diversity of structure, so far uniform that the region in question is mainly composed of ancient metamorphic rocks, gneisses and gneissose schists, mica schists, quartzites and quartzite schists, together with a variety of igneous rocks, and very ancient unmetamorphosed sedimentary formations.

Orographically, however, the region is divided into two well-marked sections by one of the most notable physical features in the whole of Great Britain. This is what is known as *Glenmore* or the Great Glen, a depression stretching from sea to sea, from Loch Linnhe to the Moray Firth, with a direction almost exactly south-west to north-east. With a length of 56 miles, it has nowhere, except at its extremities, a width under 500 feet in height of as much as two miles, but the highest point of its bottom is little above 100 feet. The summit level of the Caledonian Canal, which now¹ traverses it, is 105 feet above high water. Only 22 miles of cutting, however, had to be made for this canal, the remainder of its length being in three lakes—Lochs Lochy, Oich, and Ness—the two larger of which are upwards of 80 fathoms in depth. This depression is a geological as well as an orographical feature, inasmuch as it marks a very ancient line of fault, the region to the north-west of which has been sunk, relatively to the south-eastern section, to a great depth. Earthquake shocks are still occasionally felt both along this fault and that on the south-east—on the latter especially between Crieff and Comrie.

It does not need to be pointed out how greatly this

¹ Since 1822.

depression facilitates communication; but the practical importance of this facility is greatly diminished by the direction in which it runs, causing it to connect only two small populations—a district on the south-west, which never could and never can maintain anything but a very scanty and scattered population, with another in the north-east, more populous indeed, but of small extent. If this natural cutting had run in a direction at right angles to its actual direction, and thus led directly into the heart of the middle lowlands, there can be little doubt that the course of Scottish history would thereby have been greatly modified. The consolidation of the kingdom and the amalgamation of the diverse elements of its population would have been accomplished sooner.

But it so happens that the section of the highlands lying to the south-east of this line is the loftier and more continuous part of that area, and the general direction of the main valleys in it is nearly the same as that of Glenmore, from south-west to north-east, so that communication between opposite sides of the central mass has to be maintained by transverse valleys and more or less elevated connecting saddles. The prevailing direction of the slope and drainage on the north side of the central mass is indicated by the course of the rivers Nairn, Findhorn, and Spey on the south side by the upper course of the Tay, but none of the valleys of these rivers leads directly up to the main dividing line between north and south. The most important of the valleys referred to—that of the Spey along with the immediately contiguous valley of the upper Roy—marks off a subsection of this part of the highlands, known as the *Monagh Lea* Mountains, in which several peaks rise to above 3000 feet in height.

The valley of the Roy is nevertheless of minor importance as a means of communication. The saddle

which connects it with the Spey valley (where the waters of the two systems are within a quarter of a mile of each other) is at the height of 1150 feet above sea-level. On the other hand, the Spean valley, the main valley to which that of the Roy is tributary, and whose upper portion is separated from that of the Roy by a mountain 3700 feet in height, is connected with one of the branches of the Spey valley by a saddle only 843 feet in height, to which the approach from both sides offers a very gradual ascent. The saddle is only 24 feet above the level of Loch Laggan, whence the Spean issues. These orographical features have made the valley of the Spean one of the old established and important routes between the west and the north-east of Scotland; but this route, it must be noted, like the Glenmore route, merely serves to bring the north-eastern lowland strip into communication with the same scantily-peopled district in the south-west already referred to.

6. The Main Lines of Communication between the Central and Northern Lowlands of Scotland

The main lines of communication between the central and northern lowlands of Scotland have at all times been two in number, both now followed by lines of railway. One of these goes through the very heart of the *Grampians* or the *Mounth*,¹ ascending from the Tay by the valleys of the Tummel and the Garry to the *Pass of Drummouchter*, where the height of 1500 feet is attained, and then descending northwards by Glen Truim

¹ "This was the name given to the mountain-chain extending from near Aberdeen to Fort-William. It should be said, however, that the early Scottish writers use the term somewhat loosely" (Hume Brown, *History of Scotland*, vol. i. p. 91 n.).

through Badenoch to the valley of the Spey. The other passes round by the east of the Grampians up the valley of the Ury, and then by several branches across the lower parts of those mountains, the chief branch descending ultimately by the valley of the Deveron.

Between these two chief routes the Grampians are partly divided into two sections by the valley of the Dee, which, composed for the most part of quartzites and gneiss, descends eastwards between huge granite bosses containing some of the highest peaks of the system: *Ben Macdhui* (4296 feet), *Braeriach* (4246 feet), *Cairntoul* (4241 feet), *Cairngorm* (4084 feet) to the north, *Lochnagar* (3786 feet) to the south. In this part there are several minor routes connecting Strathmore with the valley of the Dee. The easternmost of these routes is afterwards continued northwards and then north-westwards through the Cabrach and across Banffshire to the Spey, and finally up the Glen of Rothes to Elgin. This last route is interesting, as that followed by Edward I. of England in 1295, on his return journey from Elgin, his farthest point. On his northward journey he had followed the easier and more frequented route still farther east by Glen Ury to Banff.¹ Part of the western highlands is brought into communication with the central lowlands of Scotland by the route, now throughout (since 1880) a railway route, from Dunblane to Oban. It first ascends the valley of the Teith, and attains its highest altitude, about 950 feet, in passing from the basin of that river to that of the Tay at the head of Glen Ogle.

The route of the West Highland Railway, which since 1894 has connected Helensburgh with Fort-William

¹ See the particulars of the route in Hume Brown, *Early Travellers in Scotland*.

in Inverness-shire, and since 1901 with Arisaig on the Atlantic in the same country, is entirely new, making use of a number of valleys and passes which, till the construction of this railway, were of only slight local interest. After ascending the Gare Loch and Loch Long it attains an altitude of upwards of 550 feet between Glen Falloch and Strath Fillan in passing from the basin of the Clyde to that of the Tay; one of about 1050 feet at the head of Strath Fillan, on the borders of Perthshire and Argyllshire, in passing to the basin of the Awe; one of about 1130 feet on recrossing from Argyllshire into Perthshire and the basin of the Awe to that of the Tay at the head of Glen Tulla; and finally one of about 1350 feet before descending to the valley of the Spean.

7. Communication across the Western Highlands

The main old routes marked out by the lines of valleys in this part of Scotland are all comparatively easy, nowhere rising to an elevation of 1000 feet above sea-level. Between Glenmore and the west coast there are three roads following valleys running with little deviation from east to west. Farther north the east and west coasts between Cromarty Firth (Dingwall) and Loch Carron (Strome Ferry) have been connected since 1870 by the Dingwall and Skye Railway (now a branch of the Highland Railway), which, ascending Strath Bran and descending Glen Carron, attains an altitude of only about 550 feet at the water-parting. And still farther north Dornoch Firth is connected with the west coast of Sutherland by two routes which rise to only about the same altitude, both routes running on the whole north-westwards. One of these ascends the Oyckell valley and

ultimately descends to Lochinver; the other passes alongside of Loch Shin, and afterwards branches to Lochinver and Scourie respectively.

8. The Southern Uplands

Here the routes from north to south are well marked by natural features, which have been taken advantage of from a remote period. Both the Southern Uplands of Scotland and the Cheviots have the same orographical character, though differing greatly geologically. They are composed of table-lands, many of them covered with bogs and peat-mosses, but all with grassy slopes, descending to valleys which furrow the region in different directions,—most of the main valleys, however, sloping in a more or less northerly or southerly direction, and meeting at their heads in saddles of no great altitude.

The eastern routes were naturally in early times the most important. One passed first eastwards through Haddington to Dunbar, and then along the coast east of the Lammermuirs to Berwick, where at a very early date the wide mouth of the Tweed was crossed by a bridge, but not, however, during the period 1294 to 1376.¹ During that period the route southwards was up the Tweed to Coldstream, where the river was forded. The coast road from Cockburnspath to Burnmouth by way of Coldingham and Eyemouth used to cross the gorge of the Pease Burn in a series of zigzags on both sides. These were replaced in 1786 by a lofty stone bridge, which still stands, but a new high road now runs more inland on the same route as the railway up the gorge just mentioned and down the valley of the Eye. In other parts this road is still maintained, but the main

¹ Hume Brown, *Early Travellers in Scotland*, p. 28 n.

line of the railway passes to the north of Haddington, solely, however, in consequence of the local opposition to the railway at that town when the line was laid.

To the west a route from Edinburgh, frequently followed before the time of railways, led first south-east to the west of the Lammermuirs, crossed those hills at the height of upwards of 1000 feet, then descended Lauderdale (the vale of the Leader Water) to the Tweed, crossed the Tweed at St. Boswells, and after passing down that river to Roxburgh Castle, ascended the Jed valley, and thus passed over the Cheviots at Carter Bar.

The railway route in this direction,—the so-called Waverley Route,—however, lies farther to the west between the Lammermuirs and the Moorfoot Hills in the valleys of the Esk and Gala, in passing from the one to the other of which it attains an altitude of 900 feet. From the valley of the Gala it passes to that of the Tweed, and after passing Melrose turns south-westwards to Hawick and ascends the valley of the Slitrig. Passing through a spur of the Cheviots in a tunnel at the height of about 1000 feet, it then descends Liddisdale and crosses the border to the south-west of the Cheviots.

From Galashiels the southern road is more direct, passing by Selkirk due south across the hills at elevations between 800 and 900 feet to Hawick, and then up the Teviot valley to a water-parting at the height of about 800 feet, whence one descends to the valley of the Ewes Water, and in that way to Langholm on the Esk, ultimately joining the railway route at the foot of Liddisdale.

From the lowlands of Dumfriesshire several roads converge near the head of Annandale, whence roads again diverge up the valleys of the three head-streams,

which here unite to form the river Annan. The name of the Annan is given to the shortest of those head-streams, and this may be due simply to the fact that its general direction is continued by that of the river below the confluence; but it may perhaps also be taken as an indication of the early importance of the valley of this head-stream as forming the most direct connection between Annandale and the heart of the Lothians (Edinburgh). Moffat, situated on this head-stream, is, at any rate, a very old town, mentioned as far back as the eleventh century. In its neighbourhood are remains of what appear to have been Roman roads, and it is noteworthy that both that which went direct into Tweeddale and that which passed into Clydesdale ascended this valley. The high road which now ascends this valley, passing immediately above the round-headed hollow known as the Devil's Beef Tub, containing the source of the Annan, crosses the water-parting between the Annan and the Tweed, and at the same time the boundary between the counties of Dumfries and Peebles, at the height of 1334 feet.

Another road from the point of convergence near the head of Annandale proceeds, and has long proceeded, north-eastwards up the valley of the Moffat Water, crosses the water-parting of Annan and Tweed and the boundary of Dumfriesshire and Selkirkshire at the height of 1080 feet, and then descends the vale of Yarrow past St. Mary's Loch to Selkirk.

But the third route from this point of convergence is now, and long has been, the most important of all. It proceeds north-westwards up the valley of the Evan Water, which, besides containing the high road from Annandale to Clydesdale, is now also followed by the direct line of railway from Carlisle to Glasgow. It

crosses from Annandale to Clydesdale, and Dumfriesshire to Lanarkshire, at the height of 1012 feet.

A much easier gradient connects the fertile parts of Nithsdale with the fertile slopes of Ayrshire, the greatest altitude being little over 600 feet (above New Cumnock). Nevertheless both road and railway (the Glasgow and South-Western Railway) here run for more than twelve miles through rather dreary country at an elevation of above 500 feet. In this case the county boundary is not on the water-parting, but runs across the Nith in an almost unpeopled constriction of its valley between the granite height of the Knipe on the south and the Old Red Sandstone hill of Corsoncone on the north. Branches from this road pass northwards into Clydesdale on different sides of the Lower Silurian heights of the Lowther Hill (2377 feet) and the Green Lowther (2403 feet). The eastern goes through the long and wild Dalveen pass and enters Lanarkshire at the height of 1200 feet. The western traverses the romantic glen of the Menock or Minnick Water, enters Lanarkshire at the height of 1500 feet, and passes the mining villages of Wanlockhead and Leadhills, the one in Dumfriesshire, the other in Lanarkshire.

The vales of Galloway, the valleys of the Ken and the Cree, are connected with South Ayrshire by roads at greater altitudes than that of Nithsdale, and passing over still longer tracts of dreary and sparsely-peopled country, and there is no further railway connection between north and south till one comes to the line running south from Girvan to Luce Bay at a maximum height of about 700 feet.

Of the physical features establishing a connection between east and west in the Southern Uplands of Scotland none is more striking or perhaps more important

than that formed by the nearly level vale of the Biggar Water, which flows eastwards to the Tweed, but approaches within two miles of the Clyde,¹ from which it is separated by a water-parting so low that at high water it receives an overflow from that river. Through this opening, immediately to the east of the conical felsite peak of Tinto, there is now a railway connection between the valleys of the Clyde and the Tweed, and in former times the opening was all the more important because the roads going south-westwards from the east of Midlothian to the south of the Pentlands pass directly through this gap, at the town of Biggar, in the same straight line into the valley of the upper Clyde.

¹ See Sir A. Geikie, *Scenery of Scotland*, 2nd ed. p. 349.

CHAPTER XXVI

SCOTLAND—RIVERS AND LAKES

1. The Main Water-parting of Scotland — The Chief Rivers

SOUTH of the Firths of Forth and Clyde the main water-parting of Scotland between the North Sea and the Atlantic is roughly about midway between the opposite coasts. North of that limit, however, it is generally close to the west coast, and in the broader part of the country the difference in area between the North Sea and the Atlantic basins is very notable. In about 57° N. the water-parting is within 10 miles of the west coast, but about 120 miles from the east. Nowhere is this water-parting, to the north of 56° N., as much as 30 miles from one of the numerous inlets of the west coast, and for the most part it is within 15 miles. The largest river basin on that side of the country north of the Clyde is that of the Lochy, the area of which, excluding the Nevis and Loch Eil basins, is about 410 square miles. The following table gives various numerical particulars with regard to the chief rivers of the country :—

Name.	Height of Source above Sea-level.	Area of Basin.	Length of Course.	Head of Navigation.
	Feet.	Sq. Miles.	Miles.	
Tweed . .	1500	1870 ¹	97	6 miles up.
Forth . .	3000 ²	645	94 ³	Stirling, 30½ m.
Tay . .	2980 ⁴	2400	119½	Perth.
Spey . .	1142 ⁵	1190	96	...
Dee . .	4060	700	87	Aberdeen.
Don . .	1980	530	82	...
Clyde . .	2000 ⁶	1480	106	Glasgow, 14 m.

2. The Tweed

The *Tweed* rises in the heart of the Southern Uplands, and flows at first through a characteristic pastoral valley of that region, but afterwards through a more open valley containing much corn-land picturesquely varied with meadows and woods. The same character belongs to the lower courses of its tributaries—the Gala, Ettrick, Teviot, and Leader. Below the confluence of this last feeder lies a broad tract of rich lowlands, known as the Merse, stretching northwards to the Lammermuirs. Altogether the lower part of the Tweed basin is the richest and most populous part of Scotland south of the Southern Uplands.

The tide flows 10 miles up, to Norham Castle, but the river is of hardly any use for navigation, and none at all, at least for commercial purposes, within the limits by Scotland. On the other hand, it is regarded as the best salmon, grilse, and sea-trout river in the country.

Very old bridges cross the Tweed at Peebles and

¹ Partly in England.

² Duchray Water. The source of its second head-stream, Avon-dhu, is only 1900 feet above sea-level.

³ Source of Duchray to Queensferry.

⁴ On Ben Loy or Ben Lui.

⁵ Loch Spey. The height of the source of the highest feeder of this stream is about 1500 feet.

⁶ The Daer Water.

Berwick,¹ but down to a comparatively recent period there was none between these two places. The present bridge at Peebles seems to have been built about 1467. The intervening crossing-places of the river were fords, of which those of Coldstream, Bingham, and Kelso were important at an early date. The present bridge of Coldstream, built by Smeaton, dates from 1763-1766. The present bridge at Kelso dates only from 1803, but it replaces another which had been built in 1754 and swept away by a flood in 1797.

3. The Forth Basin

The Forth is formed by the union of two head-streams about half a mile below Loch Ard in Perthshire. The southern and longer head-stream, known as the Duchray, rises on Ben Lomond; the northern, which traverses Loch Chon as well as Loch Ard, and is known as the Avon-Dhu ("black water"), on a lower hill about three miles farther north. From the point of confluence it is essentially a lowland stream, creeping sluggishly through nearly level land in very devious windings, so that, although the confluence is only about 24 miles from Alloa in a direct line, the distance by the river is about 52 miles.

The alluvial carse land on the banks of the river has from an early date been renowned for its fertility, giving rise to the proverb—

A crook o' the Forth
Is worth an earldom o' the North.

But on both sides of the river in its upper part there are extensive stretches of bog, known as Flanders Moss, in

¹ See above, p. 470.

the parish of Drymen on the south side, and in that of Port of Menteith on the northern. Formerly there was a similar moss lower down on the north bank, but this was gradually reclaimed in the latter part of the eighteenth and the early part of the nineteenth century. In the turbulent period of Scottish history these bogs aided in making of the Forth an important defence of the lowlands against incursions from the highlands.¹

The "arrowy" *Teith*, which joins the Forth from the north-west a few miles above Stirling, presents a complete contrast to the Forth. It carries along the surplus waters of two series of lakes, Lochs Katrine, Achray, and Venachar to the south drained by the main stream, and Lochs Doine, Voil, and Lubnaig drained by its affluent the *Leny*. The lowest of these lakes is about 250 feet above the level of the confluence of the Forth and Teith, and the fall of the bed of the latter river is everywhere steep. The river accordingly flows with great rapidity, and hence, though it surpasses the upper Forth both in length and in the volume of water discharged, this difference in behaviour, as compared with the Forth both above and below the confluence, has caused it to be regarded as the tributary, and the upper Forth as the true headwater of the main stream.

¹ "We crossed the infant Forth by an old-fashioned stone bridge, very high and very narrow. My conductor, however, informed me that to get through this deep and important stream, and to clear all its tributary dependencies, the general pass from the Highlands to the southward lay by what was called the Fords of Frew, at all times deep and difficult of passage, and often altogether unfordable. Beneath these fords there was no pass of general resort until so far east as the bridge of Stirling; so that the river of Forth forms a defensible line between the Highlands and Lowlands of Scotland, from its source nearly to the Firth, or inlet of the ocean, in which it terminates. The subsequent events which we witnessed led me to recall with attention what the shrewdness of Bailie Jarvie suggested in his proverbial expression, that 'Forth bridles the wild Highlandman.'"—Scott, *Rob Roy*, chap. xxviii.

4. The Tay

The *Tay* drains an even greater number of highland valleys than the Forth—all the remaining valleys of Perthshire as well as a few belonging to the adjoining county of Forfar. Its head-stream follows one of the main valleys of the Grampians¹ containing Loch Tay, but it ultimately breaks through a transverse valley



G. W. Wilson, photo.

THE TAY AT PERTH.

south-eastwards, and finally winds gently southwards through Strathmore before it widens into an estuary by which its waters are discharged into the North Sea. From near Broughty Ferry on the north side of this estuary and Ferry-Port-on-Craig on the south side, a sandbank called *Bury* or *Goa Sands* on the north and *Abertay* on the south stretches to the mouth, but this is now dredged so as to give access for large vessels to

¹ See above, p. 466.

Dundee. The tide ascends to a point two miles above Perth. The average discharge at this point is 3640 cubic feet per second (more than a half greater than that of the Thames at Teddington), but it varies greatly in amount, especially since the extensive drainage works carried on in the basin of the river have caused the flood waters to flow off with great rapidity. In the summer of 1819 the discharge was reduced to 457 cubic feet per second, and at the close of the summer of 1835 to a still lower level.

Both the Tay and the Forth cross the great fault on the boundary of the highlands and lowlands without any deviation in their course, showing that this fault can have had no influence on their flow,¹ but it is a noteworthy feature of this region that the Old Red Sandstone along the borders contains the most imposing highland ravines, such as that of the Ericht above Blairgowrie, "a regular cañon."² Above these gorges stretch comparatively broad strips of alluvial plain.

5. The Dee and Don

The *Dee* (Aberdeenshire) has a variable velocity above Castleton by Braemar, but below that place flows with an average depth of about 4 feet and a current so gentle (mostly about $3\frac{1}{2}$ miles an hour) as nowhere to turn a water-mill. Its waters are remarkably limpid—a natural result of the rocky nature of its bed and basin (above, p. 468). Once it was the most finely wooded of Scottish rivers, and enough of this wood is still preserved to add graciousness and, in places, extraordinary beauty to the scenes of grandeur which many parts of the valley

¹ Sir A. Geikie, *Scenery of Scotland*, pp. 346, 347.

² *Ibid.* pp. 174-178.

present. The river is also noted as one of the best fishing rivers in Scotland.

The *Don* has almost throughout a calm and regular current, except in times of flood, which are not infrequent. Extraordinary floods are recorded in the years 1768 and 1829. At one time it is believed to have been a tributary of the *Dee*, but afterwards it had its mouth a little to the north, about half way between the mouth of the *Dee* and the present mouth of the *Don*,—this latter being due to an artificial cutting made in 1750.

6. The Spey

The *Spey* has long had the reputation of being the swiftest river in Scotland, but this is true only of the lower part of its course. The bed of the *Spey* "is divided into three well-marked sections of unequal length. The upper section has a fairly steep but uneven slope; the middle section is gently inclined throughout, and at three several points is for some distance almost horizontal; the lower section falls steeply and evenly to the sea." In the first of those sections, from Loch *Spey* to Laggan Bridge, 14 miles, the average fall of the bed is at the rate of 23 feet per mile. In the second, extending as far as Grantown, 40 miles, the average fall is 5·3 feet per mile, the three nearly horizontal portions in this section representing three extinct lake-basins. In the third section, 43 miles in length, the average fall is 14 feet per mile, and is very evenly distributed, so that almost throughout there is a slope of about 1 in 378.

A geological examination of the bed of the river seems to show that it is "composed of two sections of different age and at unequal stages of erosion. The lower section

has been rejuvenated by uplift, and, contrary to the normal conditions of an orthodox stream, is at once younger in age and steeper in gradient than the higher portion.”¹

Formerly the mouth of the Spey formed a natural harbour at Kingston, and it still does so to some extent, but this has been rendered inconvenient by the gradual shifting of its mouth westwards since 1831, and still more so by the cutting of a new channel for its mouth in 1860. This shifting of the mouth was largely due to the quantity of loose shingle carried down by the rapid river, and ultimately out to sea, so as, no doubt, to have been the cause of the great gravel ridges which here stretch along the coast westwards. This river is also remarkable for its occasional great floods—that of the year 1829 having been particularly destructive, as in the case of the Don.

7. The Clyde

The valley of the upper *Clyde* is parallel and exactly similar to that of the upper *Tweed*. The source of the river is placed by popular usage at the head of the Little Clyde's Burn at the height of 1550 feet, on the south slope of Clyde Law, within a mile of the source of the *Tweed* and one of the head-streams of the *Annan* (the *Evan Water*); but the *Daer*, into which the Little Clyde's Burn flows, and which rises on the north slope of *Gana Hill* on the extreme south border of *Lanarkshire*, is rightly regarded as the true head-water, and is so taken in the table on p. 476. In the middle course of the river the great feature is the Falls of the Clyde near *Lanark*.

¹ See paper by L. W. Hinxman, in *Scot. Geog. Mag.* vol. xvii. (1901), pp. 185-193.

"After receiving the
rise more steeply, it
Bonnington into the
which the well-known
defile has not been
earthquake, but is in
tion, may be ascertained
Lower Old Red Sandstone



THE FALL

little below the town of
Clyde through the dales
land Craggs. There, the

'It seems some
A channel for

yet, after all, it is the
work. Nay, it would
deep gorge has been in

end of the Age of Ice, for there is an old channel close to it filled up with drift, but through which the stream has evidently at one time flowed. Running still in a narrow valley, the Clyde, after receiving Mouse Water, hurries westward to throw itself over the last of its linns at Stonebyres, and to toil in a long and dark gorge until, as it leaves the Old Red Sandstone, its valley gradually opens out, and it then enters the Lanarkshire coalfield. From the top of the highest fall to the foot of the lowest is a distance of $3\frac{3}{4}$ miles, in which the river descends about 230 feet, or 61 feet in a mile."¹ Below that to Dumbarton the average fall is only about 4 feet in a mile. From Glasgow downwards the bed of the river has been artificially deepened, but these deepening operations will be more appropriately considered with reference to that city (below, pp. 523, 524).

8. Lakes

The lakes of Scotland, if not innumerable, are at least too numerous to be worth the trouble of counting. The great majority are highland lakes, long and narrow, filling hollows in the courses of the rivers of the Highlands proper and of the Southern Uplands. In some cases they are true rock-basins, whose excavation is believed by many to be due to the action of ice.² The beds of some of these basins are partly below the level of the sea. Such lakes, being found both in the main and the transverse valleys of the Highlands, vary in this direction, stretching indeed to all points of the compass.

Of lowland lakes only two are large enough to be

¹ Sir A. Geikie, *Scenery of Scotland*, 2nd. ed. p. 351.

² See vol. i. pp. 28-30.

worthy of mention in a general sketch—*Loch Leven* in the basin of the Forth in Kinross-shire and *Loch Stenness* in Orkney; but it may be added that the lowlands of Caithness in the north-east of Scotland, and those of Galloway,—more particularly Wigtownshire in the south-west,—are somewhat thickly studded with lakes of a quite different type from those of the highlands and uplands. With regard to *Loch Leven* some particulars are given in the table below. *Loch Stenness*, in the island of Pomona, is a lake of a peculiar type. It is, indeed, hardly to be considered a true lake, but is rather a very irregular inlet of the sea, with which it communicates by an opening in the south, so narrow and shallow as not to give sea-water free access to it. It is subdivided into two sections, the northern of which is known as the *Loch of Harray*, and which communicate with one another by an opening similar to that leading to the sea. Both openings are, in fact, crossed by bridges. The water of these lakes is, however, so much under marine influence that it is only in the north of the upper section that it is fresh enough to be drinkable. The *Loch of Stenness* proper has an extreme length of $4\frac{3}{4}$ and an extreme breadth of $1\frac{3}{4}$ miles; the corresponding dimensions of the *Loch of Harray* being $3\frac{3}{4}$ and $1\frac{1}{2}$ miles.

A *bathymetrical survey* of the fresh-water lakes of Scotland is now in progress under the direction of Sir John Murray. Previous to that the only regular surveys of Scottish lakes were those made by the Admiralty of Lochs Lomond and Awe. The chief Perthshire lochs were also surveyed to some extent by Mr. James S. Grant Wilson, and a few isolated observations have also been made in Lochs Ness, Lochy, and Morar. Some of the chief results of all these observations, so far as they have yet been published, are given in the following table:—

DIMENSIONS, ELEVATION, AND DRAINAGE AREA OF SOME OF THE
CHIEF LAKES OF SCOTLAND, SO FAR AS THE PARTICULARS
CAN BE STATED

Name.	Height above Sea- level.	Length.	Breadth.		Depth.		Volume. Millions of Cub. ft.	Area of Lake. Sq. Miles.	Drain- age Area. Sq. Miles.
			Max.	Mean.	Max.	Mean.			
		Feet.	Miles.	Miles.	Feet.	Feet.			
Lomond	23	22	5	..	680	..	..	27.25	..
Ness	50	22.5	1	..	780	..	..	19.3	..
Lochy	93	9.6	1.2	..	..	..	..	..	..
Awe	118	22.75	8.25	..	..	..	..	15.6	..
Shin	270	17.5	1.5	..	..	..	..	..	..
Maree	82	12.4	2.5	..	..	860	..	9.7	..
Morar	30	11.5	1.6	..	1080 ¹	..	..	..	..
Arkaig	140	12.0	0.75	..	..	..	..	6.2	..
Shiel	16	17.5	1.0	..	..	..	..	7.6	..
<i>Lakes of Forth Basin²—</i>									
Katrine	364	8.0	1.00	0.60	495	199.2	27,274	4.78	37.42
Arklet	455	1.0	0.50	0.33	67	24.2	222	0.33	5.33
Achray	276	1.25	0.39	0.26	97	36.0	321	0.32	7.06
Vennachar	270	4.0	0.75	0.40	111	42.4	1,908	1.61	28.65
Drunkie	416	1.0	0.25	0.21	97	36.0	217	0.22	2.20
Voll	414	8.5	0.33	0.24	98	40.9	1,000	0.33	38.47
Doine	414	1.0	0.25	0.21	65	33.1	196	0.21	..
Lubnaig	405	4.0	0.40	0.24	146	42.8	1,144	0.96	34.97
Chon	296	1.7	0.30	0.25	75	29.4	358	0.43	6.21
Loch-an-Dubh	286	0.2	0.12	0.09	41	20.7	0.8	0.02	0.32
Ard	105	2.3	1.10	0.41	107	43.9	1,150	0.94	9.76
Menteith	55	1.6	1.00	0.64	77	19.8	562	1.02	6.35
Leven	350	3.65	2.60	1.45	83	14.0	2,195	5.30	50.92
<i>Lakes of Tay Basin—</i>									
Rannoch ³	668	9.25	1.0	0.75	420	..	..	..	..
Tummel ³	454	2.75	0.5	..	124	..	..	..	..
Tay ³	346	14.5	1.0	0.75	510	..	..	10.10	..
Earn ³	301	6.5	0.75	..	288	..	..	3.30	..
Ericht ⁴	1153	14.5	1.00	0.50	512	180.2	38,027	7.21	50.39
Garry ⁴	1820	2.55	0.30	0.24	113	49.9	846	0.61	22.34

¹ A sounding by Sir J. Murray, *Geog. Jour.* vol. xv. p. 312.

² Particulars from papers by Sir J. Murray in *Geog. Jour.* vol. xv. p. 330, and vol. xvii. p. 282.

³ Particulars from paper by Mr. Grant Wilson in *Scot. Geog. Mag.* vol. iv. (1888) pp. 251, fgg.

⁴ *Geog. Jour.* vol. xvii. p. 293.

9. Temperatures of Scottish Lakes

Observations of the temperatures of the deeper layers of some of the lakes of the north-west of Scotland have overthrown the idea previously entertained that the bottom temperatures of lakes were determined solely by the local air temperatures of the air down to the temperature of fresh water of maximum density; and it has been pointed out by Sir J. Murray that a study of these observations shows that the wind must be reckoned as an important factor in determining such temperatures. The effect of strong winds in redistributing the temperatures of lakes—at least of the glen-lakes of Scotland—has been clearly shown on many occasions. When such a wind blows in the direction of the length of the lake the warmer surface waters are driven to the lee end of the lake, and if the direction of the wind is long continued may even come to be depressed at that end below the surface. The repetition of such winds therefore cannot but modify the bottom temperatures considerably, and in the case of Loch Ness and Loch Lochy a comparison of the recorded deep water temperatures in six years with the mean air temperatures of the previous winter six months shows that the variations in the former do not correspond with those of the latter. It has also been shown that the bottom, like the surface, temperatures vary with the size of the lake; but in Lochs Ness, Oich, and Lochy, though they differ considerably in depth, the bottom temperatures rise and fall simultaneously.¹

¹ See paper by Sir J. Murray in *Scot. Geog. Mag.* vol. xiii. (1897) pp. 1-21; and also the temperature observations in the papers by the same author already referred to in the *Geog. Jour.*

CHAPTER XXVII

ELEMENTS OF THE SCOTTISH POPULATION AND ESTABLISHMENT OF POLITICAL UNITY

1. **The Earliest Historic Inhabitants**

AT the time of the withdrawal of the Romans from Britain (410) there can be little doubt that the part of Britain now known as Scotland was inhabited almost exclusively by people of Celtic speech. It has been already stated¹ that the people of the northern districts known as the Picts are now generally admitted to have been Celts. So also were those of Southern Scotland, even though they may have been different in origin and dialect—more nearly allied to the Britons of Wales.

2. **Roman Influence**

Of the extent of Roman influence little definite is known, but it is undisputed that that influence was in every way much more limited than in England. No attempt at permanent occupation appears to have been made beyond the earthen rampart called the Wall of Antonine, and popularly known locally as Graham's Dyke, between Carriden, near Bo'ness, on the Firth of

¹ P. 208.

Forth and Old Kilpatrick on the Clyde, in a situation analogous to that of the more southern Roman wall.¹ This rampart, of which remains are still to be seen near Castlecary and elsewhere, is ascribed to Lollius Urbicus, who commanded a force sent to this part of Britain by Antoninus Pius about the year 140. How much effective occupation this implied is uncertain. The name of only one Roman station in Scotland is known. This is *Blatum Bulgium*, which is identified with Birrens, near Ecclefechan, and about three miles south of the hill crowned by other (? non-Roman) remains at Birrenswark or Brunswark.² The Roman remains at Birrens were excavated in 1895, and one date, 158 A.D., was found. At Ardoch, a few miles from Crieff in Perthshire, an ancient camp, long assumed to be Roman, was definitely proved to be so by excavations made under the auspices of the Scottish Society of Antiquaries in 1896-1897; but this camp was temporary, and is not to be taken as an indication of permanent occupation. Similar works occur close by at Strageth, and other remains of temporary camps, judged on the ground of resemblance to be Roman, are found on the east coast at various other places as far north as Aberdeen. South of the Wall of Antonine antiquities admitted to be evidence of Roman occupation have been discovered at several places, either near the wall itself or the Firth of Forth, or on the road leading from Carter Bar to the valley of the Tweed.

3. Immigrants subsequent to the Romans

When settlers of Teutonic race and language first established themselves on the eastern coasts of Scotland

¹ See above, pp. 269, 270.

² See *Proc. Soc. Antiq. Scot.* 3rd ser. vol. ix. pp. 199, 218.

to have denoted the Firth of Forth even in the first half of the fifth century A.D., would appear to indicate the existence of such a settlement on a considerable scale as far back as that time. But it was the extension of the Northumbrian kingdom to the Forth in 547 that definitely established an Anglian tongue in the south-east of Scotland.

Before this time an important immigration had taken place in the west. Bands of *Scots* from the north of Ireland settled in parts of the present Argyllshire in the period 498 to 503, and founded the kingdom of Dalriada. Their language was Gaelic, which ultimately became the language of the highlands of Scotland generally. This is explained by some by supposing that the Picts were themselves Gaels; by others by the supposition that they spoke a language so nearly akin to the Gaelic as to be capable of coalescing with it. No other explanation would appear to consist with the local history. However that may be, there continued to exist in the north of Scotland for about 350 years after the beginning of the sixth century two separate kingdoms—that of the (Dalriadan) Scots, and that of the Picts. At the same time, it will be remembered,¹ a large part of the south-west of Scotland still formed part of the British kingdom of Strathclyde.

Other important settlements were made at the end of the eighth century—those of the *Northmen*. In 793 the Northmen invaded and ultimately overthrew the kingdom of Northumbria, and in the years immediately following they established themselves permanently in the Hebrides and in Ireland. They thus completely severed the Dalriadan Scots from their kinsmen in Ireland. About

¹ See above, p. 240.

eighty years later Norsemen settled also in Orkney and Shetland.

4. Geographical Conditions influencing the Political Settlement in Scotland

A. *The Predominance of the East over the West*

We have already seen that the chief lowland regions of Scotland are on the east side,—the valley of the Tweed and its tributaries, the basin of the Forth, Strathmore or the great valley with the lowland strips bordering the mouth of the Tay, the southern shore of the Moray Firth. From the general account of the climate of Britain (pp. 168-174) it will be seen that it is this side also which has the most favourable climate. The west has for the most too great a rainfall for the temperature, and is hence unproductive even in most of such lowlands as exist.

This combination of advantages on the east side was bound to determine, in the long run, which side of the country should ultimately contain the greater population, —on which side should lie the chief seat of power, as it also determined the language and institutions that eventually prevailed in the country. The contests between the rivals for power in the country were practically struggles for the possession of the eastern lowlands, and even though a northern Celtic dynasty finally gave unity and a name to the country, that did not prevent the civilisation that grew up under that dynasty from being essentially lowland in its nature as well as English in speech.

At the beginning of the seventh century it appeared as if a Dalriadan kingdom were going to be the dominant power in North Britain, but that was checked by a

Degsastan in 603. This has been plausibly identified with Dawston, which has given name to a small stream at the head of Liddisdale,—in which case we must suppose that the Dalriadan king was intending to advance against Northumbria by the Cheviot pass through which Liddisdale is now connected by rail with the valley of the North Tyne, and so with Hexham.

For eighty years Northumbria remained the dominant power, but not embracing the whole of the present Scotland. An attempt of Egfrith to secure his power in the North led in 685 to the defeat at Nectansmere, already referred to.¹ One consequence was that Scotland was again broken up—the kingdoms of the Scots, of the Picts, of Strathclyde, and Northumbria all having different shares. It was during this period that the Northmen appeared in the western isles.

The event that ultimately led to the establishment of a kingdom of Scotland under that name took place in the year 844. This was the union of the Picts and the Dalriadan Scots under the Scottish king, Kenneth M'Alpin. An important fact in this union was, that not merely the highlands of Scotland, but also the northern lowlands were brought under one rule, and Kenneth showed his appreciation of the geographical situation by transferring his seat of government from the west to the east. Dunkeld, on the Tay, on the margin of Strathmore,² and commanding the road from the lowlands to Drummouchter Pass, was at least made by him the ecclesiastical capital of Scotland; and it was

¹ P. 241.

² At one of the entrances to the Highlands "strongly marked by nature," noticed by Pennant (*Tour in Scotland*, 5th ed. vol. i. p. 248), where a "narrow and wooded glen . . . instantly shows the change of country."

no doubt from that centre that he waged his wars against Northumbrians, Britons of Strathclyde, and Danes and Northmen from beyond the North Sea.

From him, too, dates the claim of the kings of Scotland also to the south-eastern valleys, as far as the Tweed, now collectively known as Lothian, and it was to enforce these claims that he carried on his wars against Northumbria, making sundry expeditions in that direction.

Still it was not till about a century later that the Scottish kings fairly established themselves in the lowlands to the north of the Pentland Hills—that is, in the northern part of Lothian. Edinburgh, or, as the highland Scots called it, Dunedin, came into their possession in the reign of Indulph (954-962); but it is significant of the underlying strength of the lowlands and the lowlanders that this town retained its lowland name.

We have already seen¹ how in 1018 the Scottish boundary was extended to the Tweed. In the same year Strathclyde was acquired. From that date, therefore, Scotland may be regarded as a single country, claiming, if not always making good, its independent existence down to modern times, with dominion over at least the territory stretching to the Tweed and the Solway. But even when the kingdom was fully formed its strength lay so much in the east as to cause the west to be little regarded, of which a striking illustration is furnished by the route followed by Edward I. in 1296, “when he conquerid and serchid the Kyngdom of Scotland . . . in xxi wekys without any more.” This route, it will be noticed, is entirely confined to the east of Scotland, embracing, however, the lowlands on the Moray Firth north of the Grampians.

¹ P. 247.

Before discussing this subject it is desirable to point out that one very important influence in the early history of the civilisation of Scotland came from the west. It was hardly an accident that the Scots came to prevail over the Picts in the person of Kenneth M'Alpin. Though the Dalriadan Scots who originally settled in the glens of the south-western highlands were heathens, like the Picts, they were the people first Christianised in Scotland, and Christianity was introduced among them from their mother-land in Ireland. The missionary who introduced it was St. Columba, who landed in 563 on Iona, which remained the ecclesiastical capital of the Scots till the transference to Dunkeld already referred to. It is unquestioned that it was largely in consequence of the higher civilisation thus introduced that the Scots became a prevailing force in moulding the growing kingdom.

Now it is to be noticed that the Christianity of St. Columba and his followers differed in some respects, including its organisation, from that of the Roman Church. It has been pointed out that this difference in organisation was a natural outcome of the different circumstances. The Irish and Scottish Churches were organised on a basis adapted to tribal institutions, whereas the Roman Church, with its bishops exercising authority from the chief towns of civilised communities, was adapted to the municipal organisation of the civil life of countries that had come directly or indirectly under Roman influence. As long as the Columban form of Christianity was confined to communities tribally organised, that form survived, but in the end it gave way before influences derived from the older form of Christianity that had been introduced in

the south and south-east. It cannot be stated when this change took place, but it seems to have begun not long after the transference of the ecclesiastical capital of Scotland to Dunkeld—even, therefore, before the completion of the Scottish kingdom within its ultimate boundary.

This illustrates the importance of the influences proceeding northwards from England, and more particularly the most advanced and civilised side of the part of England adjacent to Scotland; and it is not surprising that such influences should have affected first the basin of the Tweed, and that in early times that part of Scotland would appear to have been of even greater importance than the region adjoining the Forth. This was certainly the case in the early part of the twelfth century, when a new set of influences derived from the south began to affect Scotland. In 1107 David, afterwards (from 1124) David I., King of Scotland, inherited from his father, Alexander I., the whole of Lothian south of Edinburgh, as well as Cumbria, both then held as fiefs of the English crown. Down to his death in 1153 David continued to reside chiefly in the basin of the Tweed. Berwick¹ might almost have been regarded as his capital, though he frequently resided also at Jedburgh, situated, it will be remembered, at the foot of the road leading across the Cheviots into Northumbria. These facts indicate the closeness of his relations with the adjacent parts of England. Probably in consequence of this contiguity the valleys and lowlands of the Tweed basin were already more advanced than the other lowland regions of Scotland; and it is one of the most notable facts of Scottish history that throughout his long reign David did all he could to extend first over his southern fiefs and afterwards over all Scotland the dominant influences already operating in

¹ See above, p. 271.

so were the granting of lands in Scotland to men of Norman, Saxon, or Danish extraction, and the foundation of new bishoprics as well as of abbeys for the new religious orders in connection with the Church of Rome. His motives were, without doubt, twofold: first, to strengthen the power of the crown against his more turbulent subjects in different parts of the country; and second, to strengthen the influence of the Church, on which he evidently relied as a force in favour of order and government.

But whatever may have been the motives of his policy, the measures which he adopted are a striking illustration of the continuity in the history of Europe. It was one more proof that the influence of Rome and the widespread organisation which Rome had created were not destroyed when the empire was overthrown by barbarians.

What is of most interest for us to notice, however, is that there was a continuity in space as well as in time,—that on the whole these influences spread steadily outwards in Great Britain from south to north along the lines marked out as easiest by the geographical conditions. The assignment of lands to strangers of Teutonic origin took place in many parts of Scotland. In the remoter parts it was even of more importance to the crown to have men interested in upholding the power of the crown than in the parts nearer the seat of government. Nevertheless, in the establishment of abbeys the basin of the Tweed was peculiarly favoured. Of the eight abbeys founded by David three—Kelso, Melrose, and Jedburgh—were within a short distance of one another in this basin. In the circumstances of the time, this must have had an important effect in stimulating both agricultural¹

¹ See below, p. 509.

Berwick, the one outlet and inlet by sea for this basin, became the principal port of Scotland, and received as settlers traders from the Low Countries and other parts of the continent. The Tweed basin would appear to have retained the lead in wealth among the lowland districts of Scotland down to the end of the thirteenth century, the eve of the outbreak of the devastating wars with England. At that time Berwick-on-Tweed was first in point of wealth and enterprise among all the towns of Scotland,¹ which argues at least the prosperity of its hinterland, though it must be observed that the flourishing condition of the port of Berwick was partly due to the fact that the Tweed basin had practically only one seaport, while the lowlands of the Forth have always had many.

Jedburgh Castle remained a favourite occasional residence of Scottish kings down to the time of Alexander III. (1249-86). In later days the Tweed basin suffered greatly in the border-raids, of which the remains of the numerous quadrangular keeps or peel-towers, as they are called, which line the main river and its tributaries, are memorials.

C. *The Central Lowlands*

The eastern lowlands of Scotland are continuous from the Firth of Forth to the north of Aberdeenshire, though they are contracted in two places—at the heads of the Firths of Forth and Tay. At the former place, in the neighbourhood of Stirling, they are contracted by the mutual approach of the Campsie Fells and the Ochils;

¹ Hume Brown, *History of Scotland*, vol. i. p. 131.

at the latter, in the neighbourhood of Perth, by that of the Ochils and Sidlaw Hills.

As this region is continuous geographically, so its history has been for the most part the same. The advantage of numerous seaports at every part of the coast has prevented any one district from lagging much behind the others in development. On the other hand, there is no considerable area in the region specially favoured in point of natural fertility. On the whole, however, it is the region south of the Forth and the Ochils that has at all times, since the consolidation of the kingdom of Scotland, been the most populous and important section of this part of the lowlands. Three of the abbeys of David I.—Holyrood, Newbattle, and Cambuskenneth (adjoining Stirling)—were founded in this section. Here also has been situated the capital of Scotland since the time of David's successors, though that capital has not always been at the same place; but now at Stirling, now at Dunfermline, now at Edinburgh,—all places built round royal castles occupying situations of natural strength.

D. *The Lowlands on the Moray Firth*

These lowlands are naturally isolated, as has been already shown, from the more extensive lowlands to the south by the Grampians, the lower spurs of which descend east of Banff to the sea-shore in a line of cliffs. West of Banff the lowlands spread out, and then again contract at Cullen, but west of Cullen they gradually expand more widely until at Elgin the area under 500 feet attains a width of about ten miles between the hills and the sea-coast. In the account of the

climate of Great Britain it has already been pointed out¹ that these lowlands enjoy special advantages in respect both of rainfall and temperature,—these advantages extending also up the valleys to the west of the Spey,—Findhorn, Glenmore, Beaully, and others. Here also a geological advantage is to be noted. Besides considerable stretches of fairly rich alluvium, these lowlands are occupied to a large extent by rocks of the Old Red Sandstone, which have yielded a soil whose natural fertility reveals its presence by the contrast offered by its vegetation to that of the more barren schists adjacent.²

Here, accordingly, a variety of circumstances have combined to favour the existence of a fairly dense but isolated population, and this circumstance was strikingly brought out in the history of Scotland down to a comparatively late period. In this district was founded one of the abbeys of David I. at Kinloss, north-west of Elgin, close to Findhorn Bay. Moray appears again and again as a prominent—frequently as a disturbing element in Scottish history, and the region so called was not the comparatively small county to which the name ultimately got restricted, but a region embracing the greater part of the lowlands, of which we are now speaking, as well as the adjacent highland tracts whose valleys open into them.

This was one of several districts in the outlying parts of the growing kingdom of Scotland which were placed under *mormaers*, who appear to have been a sort of hereditary viceroys. Some of these behaved at times like independent princes, and conspicuously so, it would seem, the mormaers of Moray. Early in the eleventh century, Sigurd, one of the Norse earls of Orkney, defeated

¹ Pp. 169, 170.

² Sir A. Geikie, *Scenery of Scotland*, 2nd ed. p. 221.

the mormaer of Moray in a battle on the mainland, but Malcolm II.—at that time King of Scotland—was either unable or unwilling to support his representative, and gave the victor his daughter in marriage, and afterwards conferred on his son both Caithness and Sutherland. A more notable instance of the rivalry between Moray and the kings south of the Grampians occurred later in the same century, when Macbeth, one of the mormaers of Moray, having slain Duncan, King of Scotland, near Elgin, assumed and maintained the crown (1040-57). One of the most decisive events in the important reign of David I. was the subjugation of the men of Moray. In 1130 the Earl of Moray was defeated and slain near Stracathro, a place about three miles north-east of Brechin—situated, it may be observed, at the south end of the road followed afterwards by Edward I. of England, leading from the heart of Moray across the eastern part of the Grampians.¹ But it was not till five years afterwards that the subjugation was finally effected with the aid of barons from the north of England, including some Normans, among whom David then divided the lands of Moray. The earldom was then definitively attached to the crown, whose authority David sought to make good by the erection of castles as well as the foundation of a monastery. Three years later the men of Moray formed an important part of the reserve of David's army at the battle of the Standard. Under David's successor, Malcolm IV. (1153-65), the same policy was continued. Fordun states that that king removed the men of Moray and replaced them by his own peaceful people, and Skene considers that that is probably true of the inhabitants of the plain country between the Spey and Nairn.² A rebellion in Moray troubled the beginning

¹ See above, p. 468.

² Skene, *Celtic Scotland*, vol. iii. p. 27.

of the reign of the young king, Alexander II. (1215). Just a hundred years later a new earldom of Moray was created by Robert Bruce in favour of his nephew Randolph, and in the latter part of this century new troubles began. The earldom was then divided. The upper valleys were given in 1371 to Alexander the son of Robert II., and in 1372 the lowlands were granted to John Dunbar, a grandson of Randolph, with the title of Earl of Moray; but the former, known as the Wolf of Badenoch, seems to have coveted the possession of the richer lowlands if he did not regard them as his due. At any rate he descended again and again from his castle of Lochindorb, in the lake of that name, on the margin of these lowlands between the Spey and the Findhorn, plundering and devastating the towns and fields of the plains. These lowlands were again repeatedly harried by the Lords of the Isles in the first half of the fourteenth century, and subsequently they suffered on other occasions, the distance and natural isolation from the central seat of authority placing difficulties in the way of their protection, while their comparative wealth naturally aroused cupidity.¹

Caithness and Sutherland continued to be held by the Jarls of Orkney, nominally under the Scottish crown, till 1196, when they were finally brought really under the Scottish crown by William the Lion; but though they contain considerable tracts of lowlands these are

¹ A striking illustration of the way in which this region was regarded by the Highlanders, even in later times, is given by Pennant in his *Tour in Scotland* (vol. ii. p. 172). He states that a letter existed at the time of his tour from Sir Ewin Cameron, in which he apologises to another chief for injuries inflicted by his followers, stating that when his men left Lochaber all that was intended was "to make an incursion into Murray-land, where every man was free to make his prey." Presumably the writer of this letter is the Sir Ewen Cameron (1629-1718) of whom Pennant gives a biography in his appendix.

not so favoured as the plains to the south of the Moray Firth, and they never played so important a part in Scottish history.

5. Strathclyde

In the south-west of Scotland there lay, we have seen, in early times a region sometimes known as Strathclyde, sometimes as Cumbria. Both names are geographically significant in the light of the physical features already set forth. The region so called was not confined to Scotland. It extended also into England, the kingdom of Strathclyde at one time extending as far as the Mersey. In any case it included more than was strictly known as Strathclyde (the valley of the Clyde) or Cumbria—at all times embracing also the present Ayrshire and the valleys of Dumfriesshire intervening between the valley of the Clyde and Ayrshire on the one hand and Cumberland on the other hand. But the two names may be taken to indicate that the chief centre of power lay either in the Clyde valley or in that of the Eden. The account above given¹ of the physical features marking out the lines of communication in this region shows how naturally Ayrshire was included in any kingdom extending from the Clyde to the Eden or beyond. Throughout this region English influences gradually extended, as in the east of Scotland, but more slowly, and there is reason for believing that a Celtic dialect was spoken in the Clyde valley as late as the end of the thirteenth century.

The most important event in the early history of this region after its union with Scotland in 1018 was the abortive attempt on the west of Scotland made by Haco, King of Norway, in 1263. The expedition failed through

¹ Pp. 473, 474.

the effects of a storm and unsuccessful battle at Largs, and three years later it was followed by the conquest of the Western Isles from the kings of Norway, and their annexation to the kingdom of Scotland.

6. Galloway

In the extreme south-west of Scotland there remained a region which was long even more backward than Strathclyde, and long had a separate place in Scottish history. On the borders of Ayrshire and the present Wigtownshire and Western Dumfriesshire there lay a tract of hills and upland mosses without inhabitants, severing the richer valleys of Ayrshire from the more favoured tracts on the coast and mouths of the rivers. These tracts lay to the west of the roads connecting Cumberland through Eastern Dumfriesshire with Ayrshire and the valleys of the Clyde, and the rivers here flowing from north to south would be a hindrance rather than an aid to communication in a westerly direction. This district was known as Galloway, and down even to the end of the thirteenth century the people of this district spoke a Celtic dialect, thus remaining distinct even in speech from the inhabitants of the neighbouring lowlands. It so happened that it was in this district that Christianity was first preached in North Britain, before the end of Roman domination in the island. St. Ninian, the first missionary, about the close of the fourth century A.D., built a white house (*Candida Casa*) for himself at the place afterwards known as Whithorn on Wigtown Bay. In 730, when the kingdom of Northumbria was at its height, a cathedral was founded on the same site, and a bishopric erected in connection with the Northumbrian see of Lindisfarne. But of the further history

of the church here little is known, and the people among whom it was established long retained the reputation of being the fiercest and most uncivilised people in Scotland. Here in the reign of Alexander II. a rebellion broke out (1234) which gave that king much more trouble to quell than the risings in Moray; and for a long time after Galloway continued to be a very insubordinate part of the kingdom.

7. Highlanders and Lowlanders

By the time of Alexander III. (1249-86) the northern form of the English language had spread over all the Scottish lowlands, including the valley of the Clyde and the districts on the shores of the Moray Firth. The northern highlands of Scotland, however, still and for a long time after continued to be inhabited by a people speaking the language of the early Scottish kings and known as the Scottish language. Of this people, as contrasted with their lowland neighbours, as they were in the latter part of the fourteenth century (1363-83), Dr. Skene quotes an interesting account from Fordun's *Chronicle*.

"The manners and customs of the Scots vary with the diversity of their speech, for two languages are spoken among them—the Scottish and the Teutonic, the latter of which is the language of those who occupy the sea-board and plains, while the race of Scottish speech inhabits the highland and outlying islands.. The people of the coast are of domestic and civilised habits, trusty, patient, and urbane, decent in their attire, affable and peaceful, devout in divine worship, yet always prone to resist a wrong at the hands of their enemies. The highlanders and people of the islands, on the other hand, are a savage and un-

tamed nation, rude and independent, given to rapine, ease-loving, of a docile and warm disposition, comely in person but unsightly in dress, hostile to the English people and language, and, owing to diversity of speech, even to their own nation, and exceedingly cruel. They are, however, faithful and obedient to their king and country, and easily made to submit to law if properly governed.”¹

It need not be taken as involving any qualification even of Fordun's last statement that in subsequent centuries Scottish history knows less of the fidelity and obedience of these highlanders to their king and country than of their savage and untamable disposition and their hostility even to their own people. The raids of highlanders on lowlanders were frequent. Sometimes the highlanders were temporarily victorious, but this never led to any permanent results, and, as explaining this, and at the same time throwing light on the relations of hill-tribes and plainmen at many periods of history all the world over, the following passage, written with reference to the victory of Montrose at Tippermuir in 1644, is well worth attention and consideration :—

“The victors obtained possession of Perth, and obtained considerable sums of money, as well as ample supplies of arms and ammunition. But those advantages were to be balanced against an almost insurmountable inconvenience that uniformly attended a highland army. The clans could be in no respect induced to consider themselves as regular soldiers, or to act as such. Even so late as the year 1745-46, when the Chevalier Charles Edward, by way of making an example, caused a soldier to be shot for desertion, the Highlanders who composed his army

¹ Skene, *Celtic Scotland*, vol. iii. p. 40 (quoted from Fordun's *Chronicle*, vol. ii. p. 38).

were affected as much by indignation as by fear. They could not conceive any principle of justice upon which a man's life could be taken for merely going home when it did not suit him to remain longer with the army. Such had been the uniform practice of their fathers. When a battle was over the campaign was, in their opinion, ended; if it was lost they sought safety in their mountains, if won they returned there to secure their booty. At other times they had their cattle to look after, and their harvests to sow or reap, without which their families would have perished for want. In either case there was an end of their services for the time; and though they were easily enough recalled by the prospect of fresh adventures and more plunder, yet the opportunity of success was, in the meantime, lost, and could not afterwards be recovered. This circumstance serves to show, even if history had not made us acquainted with the same fact, that the highlanders had never been accustomed to make war with the view of permanent conquest, but only with the hope of deriving temporary advantage, or deciding some immediate quarrel."¹

Thus it was that in the end it was the lowlands that were victorious over the highlands. Lowland authority gradually acquired a firmer and firmer hold. With it spread lowland institutions and the lowland tongue, so that the ancient "Scottish"—that is, Gaelic—speech is now confined, as the dominant language, only to the more outlying valleys and the islands, and is fortunately rapidly dying out even in these.² It was fortunate for the unification of Scotland that the Reformation in this country embraced for the most part the Gaelic as well as the English speaking portion of the inhabitants.

¹ Scott's *Legend of Montrose*, chap. xv.

² See Bartholomew's *Atlas of Scotland*, p. 9.

CHAPTER XXVIII

SCOTLAND—AGRICULTURE AND MINING

1. Agriculture previous to the Union of the Parliaments

OF the condition of Scottish agriculture in early times the notices are scanty, and in some cases are in such general terms that it is difficult, if not impossible, to draw any definite picture. The impressions of travellers who made only a short stay in the country are likely to have been affected by the aspect which the country happened to wear at the time of their visit, and the terms in which they set forth their impressions could not but be influenced by the standard of comparison which they would be led to form by what was most familiar to them at the time of their visit. Hence it is not surprising to meet with very diverse accounts of the country about the same period. From this point of view it may be instructive to compare the account of an English visitor who traversed the country probably early in the fifteenth century, with that of the celebrated Aeneas Sylvius Piccolomini, who described what he saw in 1435.

The English visitor referred to is one Hardyng, who made a report on the condition of Scotland to Henry V. of England, apparently with the view of indicating the resources which the country offered for maintaining an invading army. His account of many districts is favour-

able, and it is interesting to note that Fife and the immediate neighbourhood are the parts in which the greatest extent of flourishing country is described. From Doune in Menteith to Falkland is without moss or mine. Along the Scottish sea—that is, the Firth of Forth—is a country fresh and gay. From St. Andrews to the Ochils there is a strip of good country 42 miles long and in some places 6 broad. In Angus the Kerse of Gowrie is a plentiful country. But some flourishing districts are also mentioned in the west. From Glasgow to Ayr there are 24 miles of good country. Dumfries is a pretty town and plentiful.¹

Aeneas Sylvius uses comprehensive language of disgust. "Scotland," he says, "and that part of England immediately adjoining it bear no resemblance to Italy, but are nothing but a rugged wilderness, unvisited by the genial sun," and on proceeding southwards from the Scottish border he first seemed once more to behold civilisation and a country with a habitable aspect when he reached Newcastle.²

Down to a comparatively late period it seems certain that Scottish farmers were very negligent in cleaning the soil. "Very often the weeds bulked much more largely than the crop. There was especially one weed called gool, the wild chrysanthemum, that seemed to have spread

¹ Hume Brown, *Early Travellers in Scotland*, pp. 17-22.

² *Ibid.* p. 29. Of Scotland as a whole the account of Aeneas Sylvius is, perhaps, too sweeping to be very instructive, but he may be taken as a good witness to the injuries that had been inflicted on both sides of the border by the wars that had been waged almost incessantly between England and Scotland since the period following the death of Alexander III. (1286). "Northumberland," according to him, "was uninhabitable, horrible, uncultivated. The people had neither white bread nor wine. At nightfall all the men retired to a pele tower through fear of the Scots, but left the women behind, and those shared the wretched huts with cows and goats."

over the whole country, and was exceedingly difficult to eradicate. From about the earliest period of which we have documentary evidence, we find regulations made dealing severely with all farmers who suffered the obnoxious weed to grow in their fields. The monks, to whose fostering care agriculture in Scotland owed so much, refused to tolerate any tenant on church or abbey lands who allowed a single head of gool to pollute his fields. . . . In later times a fine continued to be imposed on any one on whose fields a stalk of gool was found. Gool courts were established in many baronies for the purpose of inflicting this fine.”¹

2. Scottish Agriculture in the Eighteenth Century

The first extensive improvements in Scottish agriculture appear to have been one of the results of the legislative union of Scotland with England.² Members of both Houses of Parliament in travelling to and from London observed the greatly superior condition of English agriculture, and some of the abler, more enterprising, and more public-spirited of the members endeavoured to impart the benefit of those observations to their countrymen. Clover and sown grasses were first introduced in 1720 by Lord Haddington.³ Lord Belhaven, in advice to farmers published in 1723,

¹ Murray, *Life in Scotland a Hundred Years Ago*—an extremely interesting summary of the facts collected in 1790 and the following years for Sir. J. Sinclair's *Statistical Account of Scotland* (21 vols., 1791-99: Paisley, 1900), p. 53.

² For an account of the state of Scottish agriculture at the beginning of this century see Graham, *Social Life of Scotland in the Eighteenth Century*, vol. i., more particularly pp. 153-159.

³ For this and most of the following particulars I am indebted to an article by R. S. Skirving on “The Agriculture of East Lothian,” in *Trans. Highl. and Agric. Soc. of Scot.* (1873), 4th ser. vol. v.

recommends the planting of potatoes and the sowing of turnips, but only for domestic purposes, and he entreats farmers to get at least one piece of ground enclosed. He alludes to the advanced position of husbandry in England, but informs the East Lothian farmers that he knows they could not be made to comprehend it, and he "will not affright them with hedging, ditching, marling, chalking, pairing and burning, draining, watering and such-like, which are all very good improvements indeed, and very agreeable with the soil and situation of East Lothian, but I know ye cannot bear such a crowd of improvements, this being only an ABC, or introduction to, I hope, better things."

Nothing, perhaps, could be more significant of the condition of Scottish agriculture at this time than the picture which Lord Belhaven draws by implication of Scottish farmhouses. These were evidently built by the farmers, and they were advised to build them "with lime and not with clay, and to cover them with only a few divots [sods] and plenty of straw, and not to mend them year by year with new divots, as in that case the first great rain or frost would bring the whole house about their ears."

Of the commoners of this period one of the most notable agricultural reformers was John Cockburn of Ormiston, a member of the Scottish Parliament and afterwards of the British from 1708 to 1741. His plan was to give tenants a greater interest in their holdings by long leases. Previously leases were seldom for more than five years. Cockburn introduced leases of 38 years, renewable on payment of *grassum* every nineteen years, and nineteen-year leases have remained ever since a notable feature of Scottish agriculture.

But the reforms of these pioneers seem to have spread

slowly. Lord Kames in his *Gentleman Farmer*, published in 1776, speaks of the cultivators of East Lothian (probably then as now among the most advanced, if not the most advanced, in the country) as being, with occasional exceptions, ignorant and indolent. The "whole county" was still without enclosures, and shared, portion and portion about, by the tenants. The farms were divided into in-field and out-field, the in-field receiving some attention and all the manure, while the out-field was laid under successive crops of corn till it could produce no more, and was then left for years in a state of nature. The horses were fed with thistles, and in winter—"lang helter time"—were turned out to feed as best they could. The cattle were thus naturally small and feeble. Six oxen and two horses were universally employed in the south of Scotland to draw the ponderous plough of the time, while in the north of Scotland ten, and sometimes twelve, half-starved cattle were employed for the same purpose. It was only shortly before this time that fanners for winnowing came into general use. Previously all barns were so constructed as to allow of the wind blowing through them from east to west or west to east, and no other means of winnowing grain was adopted. In 1710, however, James Meikle set up a fanner in East Lothian, but it was not till 1737 that a second fanner was erected (in Roxburghshire).¹

3. Scottish Agriculture in the Nineteenth Century ²

Ignorant and indolent as the Scottish farmers of the time of Lord Kames may have been, it would no doubt

¹ Graham, *ubi supra*, vol. i. p. 202. As to the primitive agricultural implements still in use in out-of-the-way parts of the country in the last decade of the eighteenth century, see Murray, *ubi supra*, pp. 18-23.

² See the maps illustrating the "Botanical Survey of Scotland," by

of Scottish agriculture. The want of capital must have been a serious hindrance, and there was much difficulty in procuring capital as long as there was nothing to make agriculture specially profitable. One effect of the wars of the Napoleonic period, concurring as they did with the rise of manufacturing industry and the rapid extension of external commerce in this country, was to give an extraordinary impetus to the demand for agricultural produce. Prices accordingly advanced rapidly. Agriculture became a peculiarly remunerative industry, and the Scotch banks were willing to grant lavish loans for improvements on the security of the farmers' leases, and this was all that was necessary to call forth the energy and enterprise of that class. "By 1810," says Mr. Skirving, "when Brown of Markle and Sir J. Sinclair published their agricultural works, it almost seems as if the fields of East Lothian had been touched by the wand of an enchanter. A single generation of men, during the brief period allowed to them of vigorous and manly strength, had seen the husbandry of their country rise from barbarism to take a first rank, if not the foremost place, in the agriculture of Britain and of the world."

Since then not merely East Lothian but Scotland generally has at the very least kept pace with all the advances that have been made in agriculture in the southern part of Great Britain. Differences in physical features and climate, however, are the cause of notable differences in the extent of the available agricultural surface, and the nature of the agricultural industries

Robert Smith, B.Sc., in the *Scot. Geog. Mag.* 1900. These maps, only two of which unfortunately the author lived to prepare, illustrate not merely the natural vegetation, but also the character of the cultivation at the present time. Those who have seen the maps will be glad to learn that arrangements have been made for completing the survey.

carried on in Scotland as compared with the sister kingdom. Only about 25 per cent of the surface is in crops and grass—a much smaller proportion than in any other division of the British Isles. But of this total agricultural area a much larger proportion is under corn and green crops than in England.¹ Among corn-crops oats is and always has been by far the most important. The wheat area is insignificant, and so also is that under beans and peas. The only important green crops are turnips and swedes and potatoes. Mangolds, cabbages, vetches, and tares all cover very small areas. With regard to the grasses of Scotland, both those under rotation and the permanent pasture, a notable difference when compared with England is the smaller proportion made into hay—no doubt a consequence of the moister climate. In Scotland as in England there was in the last thirty years of the nineteenth century an increase in the area under grass at the expense of that under corn and green crops, but not nearly to the same extent; and while Scotland, like England, during that period increased the number of its cattle it did not, like the sister country, diminish, but somewhat added to, the number of its sheep.

4. Mineral Products

The hills and mountains of Scotland naturally supply abundance of building *stone*. Stone has constantly been quarried for use as a building material from the earliest times, and it is still almost the exclusive building material for external walls both in town and country—brick being very little used for the purpose. Of its use

¹ Nearly two-fifths in Scotland as against about one-third in England in 1900.

in early times the vitrified forts and the curious round towers known as brochs survive as witnesses in many parts of the country. One building stone—granite—forms a considerable article even of export trade, principally from Aberdeen and Peterhead.

Scotland, like her southern neighbour, is rich in *coal*, and the production of that mineral has been stimulated during the past century from the same causes as have raised the English and Welsh production. Fifteen counties produce more or less *coal*, but five-sixths of the production is obtained from North Lanarkshire, North Ayrshire, Stirlingshire, and West Fife. The other minor producing counties are Midlothian, Linlithgow, East Lothian, Dumbarton, Clackmannan, Argyll, Dumfries, Renfrew, Kinross, Sutherland, and Peebles. As may be seen from the map at p. 368, a noteworthy feature of the occurrence of coal in Scotland is that it is largely derived from the Limestone and Millstone Grit Series of the Carboniferous System, as well as from the Coal-Measures.

Coal would appear to have been mined at Prestonpans by the monks of Newbattle as far back as 1200;¹ and in 1435 Aeneas Sylvius records how in Scotland he "saw the poor, who, almost in a state of nakedness, begged at the church doors, depart with joy in their faces on receiving stones as alms. This stone," he adds, "whether by reason of sulphurous or some fatter matter which it contains, is burnt instead of wood, of which the country is destitute."²

The coal in the neighbourhood of the Firth of Forth was largely used in the extraction of sea-salt, and a visitor to Scotland in 1636 mentions the existence of salt-pans, owing to the conveniency of coal, on the south

¹ Bremner, *The Industries of Scotland*, p. 2.

² Hume Brown, *ubi supra*, p. 26.

shore of that inlet from beyond Musselburgh to near Stirling.¹

In both of these industries, but especially in coal-mining, the condition of the labourers down even to a late period was appalling. The Lords of the Justiciary were empowered to consign tramps and vagabonds to life-long work in mines and salteries. A collar riveted on the neck of the person so consigned bore the name of the owner, to whom the labourer henceforth belonged. Even freemen who became miners, under whatever stress of circumstances, became bound to work for life in the mine which they entered, and passed with the mine to any purchaser. Sometimes even the children of miners were bound to their fathers' occupation and mine. Not till the passing of the Act of 23rd May 1775 were colliers and salters liberated from this state of serfage. It was only thirteen years before this (1762) that the steam-engine, which had been used for the pumping of mines in England since 1680, was introduced into Scottish mines, and the use of winding apparatus did not become general till much later. Till after the passing of an Act in 1842 it was the work of women in mines to carry coal up slimy wooden stairs to the pit-mouth, and it is stated that in some cases the weight so carried was as much as $4\frac{1}{2}$ cwts.²

The wealth of Scotland in *iron-ore* was long in being discovered and turned to account. In the old bloomeries which are found scattered up and down the country, the native ores made use of were chiefly bog-ores. The ores first mined were those known as clayband, found in seams in the Coal-Measures and Carboniferous Limestone rocks of Central Scotland, whence also large quantities of *lime-*

¹ Hume Brown, *ubi supra*, p. 148.

² Bremner, *The Industries of Scotland*, pp. 4-6.

stone are obtained. Until the first year of the nineteenth century the ore which is now most largely produced from the same rocks under the name of blackband was regarded as of no value. It was called by the miners wild coal, and was looked upon as neither ore nor fuel. In 1801, however, it was proved by David Mushet to be a valuable iron-ore; yet it was not till about 1830 that it came into general use in smelting. Its black colour is due to the presence of carbonaceous matter, which enables the ore to be calcined—that is, deprived of sulphur and some other noxious ingredients by burning before smelting, without the use of special fuel for the purpose.

Large quantities of *fire-clay* are also produced from the rocks of the Carboniferous System in Scotland. *Silver-lead* has been continuously mined in Scotland at least since 1517, when an important vein was discovered at Leadhills in South Lanarkshire, and with little interruption since about 1680 at Wanlockhead in the neighbouring part of the county of Dumfries, where *zinc* ore is also obtained. At an earlier date gold was mined there.

Other important minerals of Scotland are oil-yielding coal and bituminous shale, mined at various places on the borders of West and Mid-Lothian and in the west of Fife.

CHAPTER XXIX

SCOTLAND—MANUFACTURES

1. Foreign Influences

UNDER this head also the continuity of history in Europe is strikingly illustrated. Down to a late period Scotland was indebted to strangers for the improvement of her manufactures, and in accordance with the geographical position multitudes of these strangers were from England. "At an early period in our history," says Tytler, "the superior intelligence and the habits of industry of the English people induced our kings to encourage the tradesmen and the merchants of this nation to settle in these infant towns and communities [the royal burghs]. This policy seems to have been carried so far that, in 1173, under William the Lion, the towns and burghs of Scotland are spoken of by an English historian as almost exclusively peopled by his countrymen."¹

In virtue of its geographical situation also, Scotland early derived advantages from the presence of Flemish settlers, some of whom came through England, and some through the direct intercourse between Scottish and Flemish ports. For Scotland, like England, had at an early date a lucrative trade with Flanders in wool, wool-

¹ *History of Scotland*, vol. ii. (1841), p. 247; *Historical Inquiry into the Ancient State and Manners of Scotland*, sect. iv.

felts, and hides, in return for manufactured and other commodities. The number of these settlers seems to have been considerable even in the early part of the twelfth century, when "their wealth and industry as traders, fishers, manufacturers, and able and intelligent craftsmen made them excellent instruments in the hands of David the First [1124-53] for humanising and ameliorating the character of his people, and introducing among them habits of regular, civil occupation.

"We can trace the settlement of these industrious citizens during the twelfth and thirteenth centuries in almost every part of Scotland; in Berwick, the great mart of our¹ foreign commerce; in the various towns along the east coast; in St. Andrews, Perth, Dumbarton, Ayr, Peebles, Lanark, Edinburgh; and in the districts of Renfrewshire, Clydesdale, and Annandale, in Fife, in Angus, in Aberdeenshire, and as far north as Inverness and Urquhart."²

About 1600 seven Flemings were introduced into Edinburgh to instruct the people how to make says and broadcloth, but we do not know with what success. More than a century later a body of commissioners, appointed under an Act of Parliament passed in 1727 to promote Scottish industries, brought a number of cambric weavers from St. Quentin in Picardy to Edinburgh to establish that industry there, but the only permanent result of that step was to bestow the name of Picardy Place on the street in Edinburgh in which they were settled. A writer of about that date states that the Scotch at that time knew but little of the practical use and application of machinery used by other nations in many branches of business; as an ingenious mechanic on his return from Holland observed, that the Hollanders

¹ That is, Scottish.

² Tytler, ii. *ubi supra*, p. 238.

wrought more (as he expressed it) with one head than with two pair of hands;"¹ and elsewhere the same writer states that "in the old burghs weavers still went under the denomination of Brabanders, from the masters who taught them their art."²

Reference has already been made to the bloomeries which at one time existed all over Scotland, and whose situation is indicated by the heaps of slag left in their neighbourhood.³ The earliest historical ironwork on a large scale (for the time) was established by Sir George Hay at Letterewe on the banks of Loch Maree, and appears to have been the first to make use of local ore obtained by mining.⁴ Several others were established in the first half of the eighteenth century, or soon after, at different places at which wood abounded; but of all these the only ones that survived at the end of the eighteenth century were those at Bunawe or Bonawe, adjoining Taynuilt on Loch Etive, founded in 1730, and one (Goatfield) at Furnace on Loch Fyne, founded about 1754. Both of these were founded by English companies for the employment of charcoal in the smelting of imported English ores. The great development of the Scottish iron industry is, however, to be dated from the establishment of the Carron Ironworks by Dr. Roebuck of Sheffield in 1760. The site was originally selected

¹ P. Lindsay, *The Interest of Scotland Considered* (1736), p. 34.

² *Ibid.* p. 77. Further particulars with regard to the state of Scottish manufactures at this period may be obtained from this work, Bremner's work, already quoted, and Graham's *Social Life of Scotland*, etc., more particularly vol. ii. pp. 242-249; and with regard to the advances made even before the period of the industrial revolution, from Pennant's *Tour in Scotland* (observations made in 1769 and 1772) and Loch's *Essays on the Trade and Fisheries of Scotland* (1778), based on a tour made in 1776.

³ See a paper by W. Ivison Macadam in *Proc. Soc. of Antiq. of Scot.*, new series, vol. ix. (1886-87).

⁴ *Ibid.* pp. 90, 94.

on account of the advantage derived from the water-power of the Carron River in driving the blowing-engines, but the site had also the advantage of being the seaport of Grangemouth (with which it was soon connected by canal), and near deposits of iron-ore, coal, and limestone. All branches of the iron industry were and still are carried on here, and Carron was for a time the most famous foundry in Europe. Coke came to be used here for smelting within a few years after the establishment of the works, and in the year 1788 there were four coke-furnaces here, and other two at Wilsontown in North-east Lanarkshire, besides the two charcoal furnaces at Bunawe and Furnace. The total production of pig-iron in that year is set down at 7000 tons,¹ of which 1400 tons are credited to the two charcoal furnaces.

2. The Industrial Revolution in Scotland

When the inventions of Watt, a native of Greenock and a citizen of Glasgow, had given increased importance to the earlier inventions of Arkwright and Crompton, Scotland speedily reaped the benefit of her wealth in coal and iron. We have already seen that the total production of pig-iron in Scotland in 1788 was about 7000 tons. In 1796 the production had increased to from 16,000 to 19,000 tons.² It was a fortunate circumstance for Scotland that this important mineral wealth was found in those parts in which the climate and physical configuration of the country had already

¹ Scrivenor, *History of the Iron Trade*, p. 30. Graham, *Social Life of Scotland in the Eighteenth Century*, vol. ii. p. 269, gives 1500 tons as the total Scottish production for that year, but without stating his authority.

² Scrivenor, *History of the Iron Trade*, gives 16,086 tons as the "exact return" of the blast furnaces then in operation, and 18,640 tons as the "supposed amount."

fixed the bulk of the population—the central lowlands. But within this region the development of this wealth brought about a shifting in the centre of gravity. The middle lowlands of Scotland are rich in coal, both in the east and west, but the west is richer than the east. In the case of iron the predominance of the west is much greater. Five-sixths of the iron-ore of Scotland is produced in the four adjoining counties of Lanark (north), Ayr (north), Renfrew (east), and Dumbarton (east), all in the near neighbourhood of Glasgow. Hence no other town has profited so greatly by the wealth that has accrued from the working of these minerals, and the recent growth of Glasgow has illustrated the whole history of the modern industrial revolution as it has affected Scotland. This is accordingly the most convenient place in which to consider the development of that city.

3. The Situation and Growth of Glasgow

We have already seen in the previous section that Glasgow had come to be a town of some importance, larger than any other in the west, even before the industrial revolution. Commercial as well as industrial influences contributed to its rise, and the former began to operate effectively soon after the union of the Parliaments. Before that it was quite a small place. In 1708, the year after the union, its population is given at only 12,766. The reasons of this long continued insignificance could not be more fully yet compactly stated than in the following passage from a local history:—

“The City was planted on the western limits of civilisation. . . . It was remote from the great lines of

mediæval intercourse from which the commercial grandeur of Venice, Antwerp, and other wealthy cities had been acquired. It was a poor little town, planted in a very poor and thinly populated country within reach of a small river which, flowing towards a Highland region peopled by wild and lawless races, fell into a trackless and unexplored ocean. Thus, with indifferently fertile land, with a variable and rigorous climate, with no natural wealth nor valuable products calculated at that time to excite the cupidity of commercial communities . . . industrial enterprise and commercial expansion were not to be looked for.”¹

The small river on which the city stands was not even navigable except for small boats of four or five tons, and it remained in that condition till the latter part of the eighteenth century. Yet in spite of all these disadvantages the citizens of Glasgow had developed a considerable sea-going, and even foreign trade by the middle of the seventeenth century.² In 1651 they traded not merely to Ireland but also to France and Norway, and some few had ventured even to Barbados. The town grew more rapidly even than places lower down the river, where the navigation was better and easier. The reason of that obviously was that Glasgow was at the lowest point of the Clyde which could bring both banks of the lower part of the river into direct communication with its hinderland. A bridge over the Clyde, which existed before the close of the thirteenth century on the site of the present Glasgow bridge,³ fixed

¹ Bell and Paton, *Glasgow* (1896), p. 4.

² Using chiefly Irvine as its seaport down to the time of the foundation of the town and dock of Port-Glasgow by the municipality of Glasgow in the latter part of the seventeenth century.

³ This bridge was probably of wood. The first stone bridge at this place appears to have been that of Bishop Rae, erected about 1350.

for all subsequent time the focus of Glasgow as the Roman bridge across the Thames in London. When the need arose for deepening it was up to this point that the Clyde. An attempt was made by the burghs of Glasgow, Dumbarton, and Renfrew as far back as 1475 to remove the most serious obstruction to navigation—a mass of gravel at Dumbuck Ford, immediately below Dumbarton; but this and subsequent attempts in the following century were of little avail. After 1706, however, the need for such improvement was urgent. By this time the “trackless ocean” had been explored, and the Union opened the way from England to Scottish trade on the same terms as enjoyed by English traders.

Now, with reference to the development of the trade then ensued, it is important to note that the superficial configuration of Scotland gave to its hinterland not merely the “indifferent valley of the Clyde, but the whole of East Scotland from the Grampians,—one might even say from the Firth,—to the Cheviots. There are numerous natural harbours on the west coast of Scotland, but these are mostly commercially useless as being walled in by lands, cut off by mountains immediately behind them, communication with the interior. Such other ports as are found in the west have only limited facilities, and can never vie with Glasgow in the facilities for communication with the East.

The trade, stimulated by such conditions, grew so much that at the time of Pennant’s first visit in 1769 Glasgow merchants imported more than for hogsheads of tobacco, besides large quantities of wine, as well as other commodities. Its river, :

obtained for the deepening of the river to at least 7 feet. In 1772 and the years following this was actually carried out, and in 1781 the depth was as much as 14 feet. From that time has been verified the local saying, "Glasgow made the Clyde; the Clyde made Glasgow." Since 1772 this reciprocal action has been going on without ceasing. The control of the Clyde navigation is now (since 1858) vested in a Trust, composed of ten members drawn from the municipality and fifteen representatives of the shipping, mercantile, and trading interests of Glasgow. The river has been deepened almost throughout to $22\frac{1}{2}$ feet at low, $33\frac{1}{2}$ feet at high water. Three docks have been constructed, with an aggregate extent of 74 acres,—the last, completely opened only in 1900, with a depth on the sill at high-water springs of $26\frac{1}{2}$ feet. A vessel drawing as much as $27\frac{1}{2}$ feet has come up to Glasgow on a single tide.

Meantime the progress of the arts has been steadily giving an increased value to the immediate hinterland of Glasgow. When cotton was introduced as a textile material, no part of the country was more prompt in taking advantage of the circumstances that favoured the development of this industry in Great Britain than the Glasgow district. In 1796 it was estimated that there were 180,000 men, women, and children in the west of Scotland engaged in operations connected with this industry,¹—a number equal to more than one-third of those employed in it in the British Isles at the present time.

Soon, however, all other industries in Glasgow became eclipsed by those connected with iron and steel. The two charcoal blast furnaces in the highlands that were

¹ Graham, *ubi supra*, vol. ii. p. 269.

still in operation in 1796 were blown out early in the nineteenth century. All the blast furnaces now in use in Scotland, which furnishes about one-eighth of the total amount of pig-iron produced in the United Kingdom, are within a radius of 40, and most of them within a radius of 15, miles of Glasgow. The local iron-ore is largely of good quality, though unfortunately the best seams of iron-stone are gradually becoming less productive. A further special advantage of the district for the manufacture of pig-iron was turned to account when it was found that a hard kind of coal locally obtained, known as splint coal, could be used raw in the smelting of iron-ore. This was first done in 1831, and afterwards became general. Ship-building early became one of the Clyde industries, and when iron, and afterwards steel, came to be the usual material for ship-building, the Clyde below Glasgow became the principal ship-building river in the world. This has brought with it all branches of marine engineering, and in addition Glasgow has extensive manufactures of boilers, locomotives, roofs and bridges, machinery,—above all, perhaps, sugar machinery,—machine tools, pipes and tubes, and all kinds of metal-work. Chemical works of various kinds, and the manufacture of glass, earthenware, and fire-brick are also extensively carried on. The development of all these industries has drawn away both capital and labour from the textile industries, though the making of muslins is still carried on to a considerable extent, and carpet-making and other branches of the woollen industry are also pursued. The growth of the population has necessarily corresponded with this industrial development, as may be seen from the table at the end of the section on Scottish towns (p. 541).

4. Industrial Development in the West of Scotland outside of Glasgow

The iron and steel industry has called into being, or first gave importance to, a number of towns engaged in various branches of that industry. The most important of these are *Coatbridge*, *Airdrie*, *Hamilton*, *Wishaw*, and *Motherwell*,—all in Lanarkshire. Quite recently, since 1882, a new town has been created at *Kilbowie* in Dumbartonshire, about seven miles below Glasgow, by the establishment of the immense Singer sewing-machine works there. Of the older towns of the west *Paisley* still retains its importance, and in spite of being invaded by new industries of the Glasgow type (engineering, etc.), has always managed to carry on some branch of the textile industry on a large scale. The manufacture of cottons, and more particularly muslins, was followed in 1824 by that of Cashmere shawls, which was first carried on under the direction of a Frenchman, and after sundry vicissitudes lingered on to the seventies of last century. It still has very large manufactures of sewing thread, already an established industry in 1776, as well as of tapestry carpets, etc. *Kilmarnock*, the woollen bonnets of which are mentioned as far back as 1603, has also remained a considerable textile manufacturing town, and is still the principal centre of the woollen and worsted industries of the West. It retains its old industry of carpet-making, in connection with which one of the first Scottish improvements in the textile manufactures was introduced—namely, the three-ply carpet, an invention of Thomas Morton of Kilmarnock, the first carpet in which more than two colours could be interwoven. Bonnet-making, too, is still pursued, and still peculiar to this and neighbouring towns. But in addition

to these industries of the Glasgow type are also carried on. Here are the locomotive works of the Glasgow and South-Western Railway Company, and there are also manufactures of hydraulic and other machinery. In the Loudoun valley above Kilmarnock there are considerable manufactures of machine-made lace curtains. *Dumbarton* has extensive ship-building yards and subsidiary industries, and the vale of Leven, above Dumbarton, which was described by Pennant in 1769 as "decorated with bleacheries, plantations, and villas," has added to these extensive dye-works, including Turkey-red dyeing. This last is peculiarly a west of Scotland industry, which was first introduced into Glasgow (Dalmarnock) in 1785 under the direction of a dyer from Rouen. *Greenock*, in spite of the increasingly keen competition of foreign bounty-fed beet-sugar, still retains the sugar-refining industry which was founded there in 1765. In 1900 it possessed five refineries.

5. Industrial Development in the East and South of Scotland

It is in these parts of the country that the three textile industries—linen, jute, and woollen—are principally carried on. In the course of the nineteenth century, when hand-spinning and weaving were giving place to machine industry, the linen and woollen manufactures got more and more localised,—the linen in Forfarshire and Fife, the woollen in the towns of the Tweed basin. As far back as 1733 three-fifths of the linen made in Scotland was manufactured north of the Tay.¹ In these parts flax grew most abundantly, but probably an even more decisive circumstance in confining the industry in

¹ Lindsay, *ubi supra*, p. 92.

these towns lay in the fact that they were the best situated for receiving imported flax. In the course of the eighteenth century Scotland became more and more dependent on flax from abroad, and the great bulk of that material came, as it still does, from the Baltic,¹—that is, round the north of Denmark, by which route the ports north of the Tay are the first ports reached in Great Britain. *Dundee* and *Arbroath* are now the principal manufacturing centres for coarse linens (sail-cloth, etc.). During the Crimean war the dearth of the raw material required for this industry caused the Dundee manufacturers to seek a substitute suited to the machinery. This was found in jute, which has ever since been an important textile fibre in Dundee,—although latterly this industry has suffered keenly from the competition of factories erected in the country from which the fibre is derived (Bengal), as well as that due to the use of henequen for the manufacture of sacking, for which jute is largely employed. *Dunfermline* is the only noted seat of fine linen manufactures. In 1718 the art of damask weaving was introduced, and gradually there grew up a reputation—never since lost—for the manufacture of table-linen. In connection with the linen industry may be mentioned the bleacheries and dye-works of Perth and Dundee, as well as the linoleum factories of *Kirkcaldy* and elsewhere.

All the towns of the Tweed basin, from *Peebles*, *Galashiels*, *Selkirk*, *Hawick* and *Jedburgh* to *Kelso*, are now largely engaged in the manufacture of woollen or worsted goods of some kind. A specialty of this district, originally called *twills*, is now universally known as *tweed*,—first in consequence of a misreading of the original name, but afterwards in consequence of the recognition of the

¹ Loch, *ubi supra*, vol. i. pp. 89, 90.

appropriateness of the blunder. Fabrics of the same kind are now, however, manufactured in Aberdeen, Kilmarnock, Dumfries, and elsewhere. The foundry trade of Carron has since the beginning of the nineteenth century extended to the adjacent town of *Falkirk*, which, having the advantage of canal and railway carriage east and west, and of the port of Grangemouth for sea transport, has become one of the chief seats of foundry-work, especially the manufacture of grates and stoves, in the kingdom. The manufacture of paraffin and paraffin-oil is largely carried on at several places in the vicinity of the deposits from which the raw material is extracted. Shipbuilding is a more or less important industry at several places on the Forth (*Kinghorn, Leith, Inverkeithing*), as well as at Dundee and Aberdeen.

CHAPTER XXX

SCOTLAND—CHIEF TOWNS

1. General Observations

NEARLY all the chief towns of Scotland have been mentioned in the preceding sections, as most of them are more or less manufacturing towns. Their situation, however, shows that in most cases they arose as centres of trade. A large number of them, especially on the east coast, are seaports, most of these also fishing towns. The inland towns are situated mostly either at the mouths of valleys, the more important at the meeting-place of two or more valleys, for which they would serve as centres of exchange. The conditions giving rise to Scottish towns having operated from an early period, the majority have existed almost throughout Scottish history. Only a few have been added through the development of the mineral wealth of the west, as stated in the previous section. On the other hand, in the east of Scotland the journey of Edward I. at the end of the thirteenth century embraced nearly all the towns that are at all important on that side at the present day. The only old town which has disappeared from the list is Roxburgh, which has given place to Kelso on the opposite bank of the Tweed.

2. Royal Burghs

The town just mentioned, Roxburgh, was one of the four first royal burghs,—communities transformed “by the favour of the sovereign into chartered corporations of merchants, endowed with particular privileges, and living under the especial protection and superintendence of the king.”¹ The earliest period to which such burghs can be traced is the reign of Alexander I. (1107-24), when, besides Roxburgh, Edinburgh, Berwick, and Stirling enjoyed such privileges. The number of royal burghs was gradually increased, and, as stated elsewhere (p. 545), some of these privileges have been handed down to this day. Among other privileges these burghs had for mercantile purposes courts of their own, and an appeal lay from these courts to a higher court, known as the Court of the Four Burghs, namely, the four oldest burghs above named.

3. Seaports

The very number of the seaports on the east is enough to prevent any one of them attaining that unique importance which has been acquired by Glasgow on the west; and it may also be pointed out that there is no port on the east which has the same exclusive position in relation to the great hinderland of the west, which Glasgow has, with relation to a large, populous, and opulent hinderland on the east. *Leith*, which, as the port of Edinburgh, has the largest trade on this side, and probably has the bulk of the trade between that western hinderland and the North Sea and Baltic, so far as it is carried on by the east coast, has yet a rival in *Grange*-

¹ Tytler, *ubi supra*, vol. ii. p. 246.

mouth, which is in some respects better placed for that trade. The trade of this port with Glasgow began as soon as Carron wharf was opened, and Pennant in 1769 remarks that, whereas twenty years before there were not three carts in Falkirk, there were then above a hundred "supported by their intercourse with Glasgow." It was for this trade that the Forth and Clyde Canal was constructed between 1768 and 1790. This port



DUNDEE.

Valentine, photo.

and *Kirkcaldy* are both great coal-exporting ports, and so also to a less extent are Leith, *Borrowstounness* (Bo'ness), and *Alloa*. Of the ports north of the Forth the most important is *Dundee*, which, besides carrying on a large sea-going commerce in connection with its own manufactures and those of neighbouring towns, has long been the chief seat of the whale and seal fisheries in the kingdom. In olden days *Perth* also was an important seaport, the wealth of which is stated in a

wretched distich¹ composed
the foundation of the town
whom it received a charter in
the kingdom. It carried on
1286. Now the vessels of
reach its quays are engaged in
trade. A good harbour, access



ABERDEEN

feet, at the mouth of the South
Montrose by the scour of the tide
and in at the mouth of the shallow
mudflat, behind the town, which
coasting and even foreign trade
trade, both coasting and foreign, is
at the city on the Dee, a city with

¹ *Transis, ample Tai, per rura
Regnum sustentant istius orbis*

stately aspect, through being built entirely of the grey granite quarried in its immediate vicinity. *Peterhead*, farther north, is also a granite town, being built of the red granite found on its bay to the south. It was the first port in Scotland to start sealing and whaling voyages (in 1788), and it still has important herring fisheries, though not so extensive as those of *Fraserburgh*, situated still farther north, exactly at the mouth of the Moray Firth, and on the meridian of 20° W. *Inverness*, well known for the beauty of its situation and as "the capital of the Highlands," and now the great centre for the moors, has little more than a coasting trade. *Wick* on the east coast of Caithness, and *Stornoway* on Lewis, are both great fishing centres. *Kirkwall*, on the mainland of Orkney, whose cathedral, dedicated to St. Magnus and dating from about 1137, bespeaks its former importance in the days when the islands formed part of a Norwegian jarldom, is still the chief port of the group to which it belongs, as *Lerwick* is of the Shetlands.

On the west coast the only great seaport is Glasgow, an account of the growth of which has already been given (pp. 521-525) in connection with the development of Scottish industries. *Oban* can hardly be called a seaport, although well known through its tourist traffic, created partly by the beauty of its own situation, partly by the fact of its being one of the best entrances to the Western Highlands, and partly by the convenience it affords for visiting the interesting adjacent islands of Iona and Staffa. *Ardrossan*, *Irvine*, *Troon*, and *Ayr* are all great coal-ports, *Ardrossan* taking the lead in the amount which it sends abroad.



OBAN.

Valentine.

4. Edinburgh

From the table at the end of the next section it will be seen that Edinburgh was still the most populous town in Scotland at the beginning of last century. This it owed to the fact of its having long been the capital of the country, and its continued growth in population is partly to be ascribed to its still retaining some of the prerogatives of a capital. It remains the seat of the Supreme Courts of Law in Scotland. It is the place of meeting of the General Assembly of the Kirk of Scotland. It contains the General Register House for the country, including the Scottish Census Department. Its prestige as a capital has also caused it to become the headquarters of many national institutions having no State recognition, such as the Royal Society of Edinburgh (founded in 1783), the Society of Scottish Antiquaries, the Royal Scottish Academy, which has its home in the National Gallery, the National Portrait Gallery, and the Royal Scottish Geographical Society (founded in 1885). The same cause, combined with the beauty and general amenity of its situation, has enabled Edinburgh to retain its position as a favourite residential city, and these circumstances, added to the fame of its university,—the most frequented in Scotland and the most largely attended by students from England and abroad,—have contributed to make it the great educational centre which it has long been known to be. Commerce is extensive. Having the advantage of vicinity to many foreign ports, and in relation to these a large and wealthy hinterland both in the east and west, it carries on through its ports of Leith and Granton a foreign commerce nearly as great in value on the import side, and about three-fifths as great in the aggregate, as that of Glasgow. It is not a manufacturing

town, but in one trade, that of printing, it takes a high rank. This is partly due to its old reputation, now greatly declined, as a publishing centre; but still more, in all probability, to the amount of printing required in connection with the legal business of the city, which enables these printing-houses which share in that trade to compete on favourable terms for the business of London publishers. When all these things are taken into account, it is easy to understand why Edinburgh in the century just completed has kept pace in its growth with the general growth of the population.

It has already been pointed out (p. 498) that the precise site of Edinburgh was originally fixed by the advantages for defence offered by the noble rock on which its Castle stands. This rock, strikingly similar in appearance to that crowned by Stirling Castle, and the same in origin, a mass of intrusive basalt, rises to the height of 383 feet, with precipitous sides on the west, north, and south, and from it the ground slopes, as at Stirling, gently eastwards.¹ The name of the city is traditionally and, no doubt, rightly taken to mean the burgh of Edwin, the King of Northumbria, who extended his sway over Lothian in the beginning of the seventh century; but it was long in becoming the capital of Scotland. It first came into the hands of a Scottish king in the middle of the tenth century. It was first made the meeting-place of a Scottish Parliament by Alexander II. in 1186. It did not become a regular royal residence till the reign of Robert II. (1371-90), and not till after the death of James I. (1437) was it formally recognised as the capital of the country.

¹ This formation, described by Prof. James Geikie as "crag and tail," is explained by him as due to the erosive action of the ice-sheet of the glacial period operating on the side from which the sheet advanced, and the deposition of glacial drift on the opposite or sheltered side.

In the time of Robert II. it was visited by Froissart, who speaks slightly of its size. "Edinburgh," he says, "notwithstanding it is the residence of the king, and is the Paris of Scotland, is not such a town as Tournay or Valenciennes, for there are not in the whole town four hundred ¹ houses."

Even long after the time of Froissart it continued to cover but a small area. The High Street descended, as it still does, from the Castle along the eastern slope above mentioned, and was, and is, continued, under the name of the Canongate, to the Abbey and Palace of Holyrood at the foot of this slope. The city did not stretch at all beyond this ridge northwards, and only a short distance southwards. On the north it was bounded till 1763 by an artificial lake known as the Nor' Loch, formed in 1450 by means of a dyke near the bottom of Leith Wynd to save the expense of building a wall on that side of the city. On the other sides the city wall, remains of which are still seen in a steep and narrow street called the Vennel, was of limited extent. To the south, but beyond the wall, lay another small lake, the Burgh Loch, not completely drained till 1840, since which date it has formed the public space called the Meadows.² The old town was thus in a large measure insulated, and was hence called by French writers of the sixteenth century Lislebourg.³

In order to accommodate a large population within the shelter of the Castle guns, the town grew in height rather than extent, which gave to the High Street an imposing aspect, which it still in some degree possesses,

¹ Such, and not "four thousand," says Hume Brown (*History of Scotland*, p. 182), is the reading of the best MSS. of Froissart.

² See the map of the site of Edinburgh in ancient times, after H. M. Cadell, in *Scot. Geog. Mag.* (1893), p. 336.

³ Hume Brown, *Early Travellers in Scotland*, p. 75.

but, according to Scott, was even greater before the changes made in it in the latter part of the eighteenth century, till which time "an uninterrupted line of very lofty houses" producing "a stately and almost sublime effect" stretched from the Luckenbooths,¹ which seemed almost entirely to close the western extremity, extending along the whole northern side of St. Giles's Cathedral to the gateway separating the High Street from the Canon-gate, called the Netherbow Port.²

The uninterrupted line of which Scott speaks has since been broken by openings made for various streets. One of these was that leading to the North Bridge, erected in 1765-72 to establish communication with the New Town of Edinburgh, which was then coming into being. The most striking feature of this new town is Princes Street, the glory of which is that it is one-sided, commanding a view, across gardens on the site of the former Nor' Loch, of the Castle and the back of the High Street. In many other parts of the new town the streets are unfortunately characterised by a dreary uniformity of architecture, unredeemed by that loftiness which in the High Street raised in Scott's mind the idea of sublimity, so that, apart from a few buildings, the eye is charmed only by the frequent glimpses of the Firth of Forth and the hills of Fife behind when one looks northwards. But in the extensions and reconstructions now going on in Edinburgh there is much improvement in this respect. Everywhere there are signs that the inhabitants take in their city an affectionate pride, which, it is to be hoped, will in the future become only warmer and more widespread. A notable feature of the recent street

¹ Removed in 1803, and the adjoining old Tolbooth (the prison—scene of the most picturesque incident in *The Heart of Midlothian*) in 1817.

² Taken down in 1764.



G. W. Wilson, photo.

EDINBURGH.

architecture is the frequent adoption of the baronial style, one that allows of great variety with a remarkable uniformity in general effect, whose quaint irregularities are admirably blended with the frequently abrupt inequalities of site.

5. Growth of the towns in the Nineteenth Century

From the following Table it will be seen that at the beginning of the nineteenth century not a single town had as many as 100,000 inhabitants. Only two had more than 10,000, and three others more than 5,000. The figures of later years show, as in England, the rapid growth of the subsequent industrial and commercial development of the country.

POPULATION IN THOUSANDS (ROUND NUMBERS)

	1801.	1851.	1901.		1801.
Glasgow . . .	77	148	760	Hamilton . . .	6
„ with suburbs	81	345	910	Perth . . .	15
Edinburgh-Leith	83	194	308	Motherwell . . .	—
Dundee . . .	26	61	161	Falkirk . . .	9
Aberdeen . . .	18	54	153	Ayr . . .	5
Paisley . . .	17	32	79	Dunfermline . .	10
Greenock . . .	17	37	68	Arbroath . . .	5
Coatbridge . .	—	—	37	Airdrie . . .	1
Kilmarnock . .	8	19	34	Inverness . . .	9
Kirkcaldy . . .	3	5	34	Wishaw . . .	—

CHAPTER XXXI

SCOTLAND—LOCAL ADMINISTRATION

THE local government of Scotland differs very much from that of England, but there is a certain general resemblance, and this tends to increase with time, partly because of the influence which each country has upon the other, and partly because similar causes are at work in both, modifying local government in the same direction.

Counties, parishes, and burghs are found in Scotland as in England. It is a natural consequence of the fact that the surface of Scotland is generally more elevated than that of England that the county boundaries there run more frequently along elevated water-partings; but a striking illustration of the fact that it is the aggregation of population, and not this physical feature as such, that is the determining influence in marking out these boundaries is to be found in the common boundary of the counties of Perth and Inverness. There Loch Ericht belongs partly to one county, partly to the other; but while the shores of the lake are for the most part too steep to be habitable, either end of it is in direct connection with the inhabited valleys of the county to which it belongs.

Parishes are classified as burghal, landward, or partly

enclosed wholly, partly, or not at all by a burgh. There are but eight entirely burghal parishes.

Every parish has a council similarly constituted and elected to that of an English parish. In burghal parishes, or parts of parishes, this council has little to do except to administer the Poor Law; but outside the limits of burghs it performs functions analogous to those which in England are divided between rural parishes, rural districts, and unions. It does not, however, perform by any means all the functions of these various authorities, for highways in Scotland are under the control of the county, and so is the carrying out of the Public Health Acts. The Scotch Poor Law Combination, where it exists, corresponds to the English Poor Law Union. Parishes may also be grouped to form highway or sanitary districts. It is not the rule, however, to unite parishes for poor-law or any other purposes.

The School Board system exists in Scotland, but with modifications, of which the principal are as follows:—

In Scotland the ecclesiastical parish, or a combination of ecclesiastical parishes, has been taken as the area, outside burghs, in which School Boards should be established. This is because, when they were instituted in 1872, there was already existing a system of national education, centuries old, under which a school was provided in every parish and burgh. These schools passed under the School Boards, whose domain covers the whole country. A further difference is that Scotch Board Schools are not restricted to the giving of elementary education, nor are they under any restrictions as to nature of the religious teaching which they shall give.

The chief county officials are the Lord-Lieut. and the Sheriff-Principal, both of whom are appo

the Crown. The Lord-Lieutenant represents the Crown for military purposes. He also fills the office of High Sheriff, the duties of which are not very onerous. The Sheriff-Principal is a salaried official. He is the county judge, and is also entrusted with important administrative authority. His sheriffdom usually extends over more than one county, but he is represented in each of them by a sheriff-substitute, also appointed by the Crown. The sheriff-substitute summons juries, arranges for Parliamentary elections, and performs most of the duties of the sheriff's office. He also holds a court, but there is an appeal from it to that of the Sheriff-Principal, who is required to hold three or four sittings annually in every county under his jurisdiction.

Justices of the peace are appointed on the nomination of the Lord-Lieutenant. They hold a court of quarter-sessions four times a year, and divide the county into petty sessional divisions for the performance of their less important duties. All this is as in England, but they have never had so many functions as English justices have had, because, previously to the passing of the Local Government Act of 1889, which instituted a system of county government in Scotland similar to that which had been established in England by the Act of 1888, the principal county administrators were the Commissioners of Supply, a body originally appointed to collect and apportion the land-tax, but to whom other powers had been given. They still exist, and among the powers which remain to them is the appointment of one-half of the members of the Standing Joint Committee, which controls the county police. The other half of this committee is appointed, as in England, by the county council.

In the courts of sheriffs and of justices, and in burgh courts, there is an official called the Procurator-Fiscal,

who undertakes prosecutions. The procurator-fiscal of the sheriff's court investigates not only criminal affairs, but also cases of sudden or suspicious death.

With regard to burghs, these were anciently divided into royal burghs, burghs of regality, and burghs of barony, and these names still survive, though the distinction is no longer of importance. There are, however, still two classes of burghs; the one class consists of royal and parliamentary burghs, the other of police burghs. Burghs of regality or of barony may be either parliamentary or police burghs.

There are seventy-nine royal and parliamentary burghs. The class includes all the large towns and cities, but also many very small places; indeed, not more than half of these burghs have populations numbering more than five or six thousand.

Whether large or small, they are governed by a burgh council, consisting of provost or lord provost, bailies, and councillors. Councillors are elected by the people, and, from themselves, choose the provost and the bailies. An English town council may choose its mayor and aldermen from outside its own body, but the Scotch council has no such option. Other differences from the English law and practice are that provost and bailies sit for three years like the councillors, and that, not the provost only, but every bailie also, is a magistrate of the burgh.

Every royal burgh has institutions which have survived from the Middle Ages. Generally these differ in the various towns. Among those which are common to all is the existence of two *ex officio* members of the town council representing the old merchant and trade guilds, which still survive, though they have now nothing to do with local government. Of these officials, one, called the Dean of Guild, presides over a committee of

architects and practical men which regulates the height of buildings, the width of streets, and otherwise carries out the Building Acts. This committee is called the Dean of Guild Court, and has full power to enforce its decisions. There is no appeal from it except to the Court of Session, the supreme civil court of Scotland.

Another feature of a royal burgh is that it invariably possesses a considerable amount of property in city land. The revenue of this goes into a fund called the "Common Good."

Police burghs are small urban communities governed by elected commissioners with powers somewhat narrower than those of a burgh council, in the same way as the powers of an urban district council are narrower than those of a borough council in England. Their name indicates that they control their own police, but this privilege is now restricted to burghs with not less than 7000 inhabitants. Even these may combine with the county for the maintenance of a police force if they think fit, and many of them do so.

As to local finance, there is an important difference to be noted between the practice prevailing in England and that of Scotland. In England all rates are paid by the person who occupies the premises rated; in Scotland rates are divided between owner and occupier.

Municipal enterprise has made rather better progress in Scotland than in the sister country, at any rate so far as the larger burghs are concerned. If we consider the twelve largest towns we find that all without exception get their water from a public authority. Leith gets its water from the Edinburgh Corporation. The rest supply themselves. Nine of them supply themselves with gas. Electric light is not so generally provided, but it is provided by seven of the twelve large



towns. Markets, tramways, artisans' dwellings and lodging-houses, baths and wash-houses, libraries and cemeteries, are among the other enterprises which some (generally most) of them have engaged in. Glasgow is the most conspicuous example.

Glasgow boasts itself the second city of the British Empire. Its population, over 760,000, is more than 80,000 in excess of that of Liverpool; its ratable value (£4,946,000 in 1900) is nearly a million more than that of the English city; its area (12,688 acres) is one-fifth part less. These facts speak emphatically as to Glasgow's overcrowded condition. A quarter of its population, indeed, lives in single-room tenements. Perhaps the greatness of the need has stimulated the efforts of the Glasgow Corporation to provide a clean and healthy city. Certainly municipal enterprise there has done greater things than in any other town in the United Kingdom.

So long ago as 1866 it obtained an Act of Parliament which established a City Improvement Trust, with powers to acquire, demolish, and rebuild an area of 88 acres in the heart of the city. Upon this relatively small area about 51,000 people were crowded. The houses were insanitary, and many of them were common lodging-houses of the worst type. In the course of twelve years the Trust pulled down a great many of the houses and sold the land, or most of it, for rebuilding. Thus thirty new streets were made and twenty-eight old ones widened. Two filthy streams were covered in, and a park was laid out. In addition to this, land was purchased in the suburbs and laid out for artisans' dwellings. A fall in the value of building lands checked the operations of the Trust, and during the twelve years that followed not much was done. The Trust continued

in possession of what remained of its insanitary property, doing but little to clear it away and replace it with better. In 1889, however, it again aroused itself, and since that date it has demolished almost all that remained of the old unimproved houses, and has built on the site 335 new houses and twenty-four blocks of tenements. There are now about 7000 people living in Glasgow's municipal houses.

These houses are all remarkably well built, but the rents are extremely low. For £4:10s. a year can be obtained a tenement consisting of a room 12 feet 6 inches by 15 feet, and 10 feet high. A screen of corrugated iron cuts off part of the room, and this part is divided into two bed-closets. A three-roomed tenement lets for £16 per annum.

Glasgow has now seven municipal lodging-houses, one of them exclusively for women. They contain nearly 2500 beds, which are let at 3½d. and 4½d. a night. The sleepers in these houses have each about 400 cubic feet of air space.

A yet more remarkable municipal enterprise is, however, the Family Home. This is meant to provide some amount of home comfort for working-class widows or widowers with young children. It is neither a charitable enterprise nor a profit-making one: the Corporation seeks to make the institution just cover its cost. It is a large building, lighted with electricity, and warmed by steam pipes, with a common kitchen, dining-hall, and reading-room. Meals are provided at a low tariff for those who do not prefer to cook their own. The children have a nursery to play in, and by day, while the parent is away from home at work, are fed, washed, dressed, and otherwise attended to by nurses.

In securing an ample supply of pure water for its

inhabitants Glasgow was early in the field. The city bought its waterworks in 1855, and established works to draw a supply from Loch Katrine, 35 miles away. In 1882 it commenced a second aqueduct and a new service reservoir, and these works are now nearing completion. The supply of water in Glasgow is constant and unlimited for all domestic purposes, and shower-baths may be found in houses letting at £15 a year. The water rate is very low—only sixpence in the pound for domestic purposes—and it can be bought for trade purposes at fourpence the thousand gallons.

Glasgow acquired its gas supply in 1869. The gas is supplied at the low rate of 2s. 6d. the 1000 feet, and is of exceptionally high illuminating power.

Glasgow has also owned its electric supply since 1892, since which time the quantity of electricity generated has grown from little over four hundred thousand Board of Trade units to nearly three and a half millions.

It laid its tram lines in 1870, but leased them. It has worked them itself since 1894. It did not take over the horses, cars, etc., of the old company, but built its own cars and purchased fresh horses. The new cars are very much better than those they superseded; the fares are lower, and the condition of the employees has been improved. Electric traction has been introduced. The number of passengers carried increased from less than 54 millions in the last year of the private company's management to upwards of $127\frac{1}{2}$ millions in 1899-1900.

Glasgow has eight bathing establishments, with laundries attached, and four other laundries. One of these has private baths attached, but no swimming-bath. Besides these, the wash-houses built for the tenants of the

Corporation's dwellings may be used by the public when not already occupied.

The Cleansing Department of the Glasgow Corporation has been especially enterprising, not only in its care for the health of the city, but also in devising means for the profitable disposal of the vast quantity of refuse (nearly 1200 tons a day) which it collects from household dustbins, slaughter-houses, markets, the streets, and other sources. Glasgow's waste paper, for example, is not generally collected along with ashes and other refuse, but there is a separate collection of this article from about 1600 shops and offices.

Glasgow benefits from this in two ways: first, because the nuisance of waste paper being caught up from dust-pails and blown about the streets is minimised; and next, because the sale of the paper realises a profit in relief of the rates.

Another profitable enterprise has been the preparation for sale of the clinkers obtained from the destructors where household and other refuse is burned. These until recent years were got rid of by "tipping" them on to vacant land; but since 1896 they have been broken to a convenient size and sold to builders for use in the manufacture of concrete and other similar purposes. The experiment was first tried in the year ended 31st May 1897; in which year the quantity of clinkers sold amounted to 2133 tons. The sale increased year by year; and in the year ending 31st May 1900, 9184 tons were disposed of, realising nearly £1100. The whole of this sum is, in a sense, profit; because the cost of preparing the clinkers for sale does not exceed that of preparing the clinkers for sale does not exceed that previously incurred for "tipping" them on to land.

Glasgow disposes of much of its refuse by using it in reclaiming bog or manuring sterile land. It owns or

leases a number of farms, the total area being over 900 acres. During the year ended 31st May 1900, more than 175,000 tons of refuse was deposited upon this land; and crops, including hay, straw, turnips, oats, wheat, and potatoes, were raised, the value exceeding £3300. Most of these crops were consumed by the horses of the Glasgow Corporation.

The first and most interesting of these ventures was the acquisition on improvement lease of 98 acres of bog, known as Fulwood Moss, about ten miles from the city. Other land has been added to this, so that the estate now covers about 140 acres. The land has been thoroughly drained and a railway run through it to facilitate the deposition of refuse and the removal of crops, and now what was originally a wretched bog yielding no return to its proprietor is a valuable tract of fertile agricultural land. In connection with this estate Glasgow has one thing to regret—it is, that it reverts to its proprietor in the year 1910; in the meantime, however, it continues to serve admirably the purposes for which it was acquired, receiving every year 50,000 tons or more of refuse, which must be disposed of in this or in some other manner, and producing crops which in the year ended 31st May 1900, for example, were worth over £900.

Glasgow owns its markets and its slaughter-houses.

It manufactures from its sewage a fertiliser which has a large sale.

Finally, it has provided its citizens with parks, recreation grounds, and a botanical garden; with an art gallery and a museum; and with a "people's palace," where reading-rooms, a winter-garden, an art gallery, a museum, and a concert-hall are combined under one roof; and though the city has not done so much in the direction of establishing free libraries and reading-rooms as might

have been desired, it has one very fine reference library—founded in 1874 by a Mr. S. Mitchell, and named after him,—and has recently obtained power from Parliament for the establishment of lending libraries and newsrooms.

From what has been said it will be seen that Glasgow's municipal enterprises are carried on without burdening the rates; most of them realise a handsome profit, so that, besides such direct advantages as abundant and pure water and cheap and excellent gas, her citizens have also the good fortune to live in a city where the rates are exceptionally low.

1. Administration of the Law

The law of Scotland is not the same as that of England, and, except that the supreme court of appeal for both countries is the House of Lords, it is administered by entirely different tribunals. Except for the House of Lords, the supreme civil court of Scotland is the Court of Session. This court has existed since 1532, when it was instituted by James V. on the model of the Parliament of Paris. Reorganised in 1830, it consists now of the Lord President, the Lord Justice Clerk, and eleven other judges. It sits permanently in Edinburgh.

It is divided into Inner and Outer Houses; and the Inner House is further divided into two divisions. One of these divisions consists of the Lord President and three other judges, the other of the Lord Justice Clerk and three other judges. The Outer House consists of five judges, called Lords Ordinary, who hold separate courts. Appeals from their decisions lie to one or other division of the Inner House; or, if the occasion demands it, the whole Inner House is assembled.

The supreme criminal court is called the High Court

of Justiciary. It is presided over by either the Lord Justice General or, in his absence, the Lord Justice Clerk, and the judges of the Court of Session, all of whom are lord commissioners of justiciary. The jury in this Court consists of fifteen persons, and the verdict is not required to be unanimous—the verdict of a majority suffices. For the purposes of this Court Scotland is divided into three circuits, southern, western, and northern, and the judges of justiciary travel each of these circuits twice a year.

Sheriffs' courts, burgh courts, and the courts of justices of the peace decide suits where the sum claimed is not a large one, and try minor offences against the law.

2. Ecclesiastical Administration

There is not so close a connection between Church and State in Scotland as there is in England; the Church of Scotland is presbyterian in doctrine and in form of government. The ministers and elders of each kirk form the kirk-session—a body with authority over the kirk and throughout the parish. Parishes are grouped under eighty-four presbyteries: to these councils each parish is entitled to send its minister and one elder. The presbyteries again are grouped into sixteen synods. Surmounting all is the General Assembly. This is held annually in Edinburgh. It consists of representatives from all the presbyteries, royal burghs, and universities in the country.

The main body of dissenters in Scotland is very similar in doctrine and organisation to the Established Kirk, almost the sole distinguishing principle being the rejection of the very idea of State control. Several such bodies were formed from time to time by secession from the Kirk or splits among churches that had already

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CHAPTER XXXII

IRELAND—PHYSICAL DESCRIPTION

1. **Geology and General Orography**

IRELAND'S geological vicissitudes have been as varied as her historical. She has been alternately plunged beneath the sea and upheaved above its level time after time. Twice, at least, in the end of the Silurian period, and again towards the close of the Devonian, her surface was wrinkled as a woman wrinkles a cloth. Twice, once at the close of the Silurian epoch, and again much later, yet still at a time when the Alps were not, nor the Pyrenees, molten rocks were forced in welling tides through vents in the earth's crust, and thence spread far over the surface of the land. She has sweltered in the tropic heats of the Carboniferous atmosphere; she has been dried to the bone in the arid Triassic air; she has been iron-bound under the ringing frosts and ices of the Glacial Age. Before this last visitation she, in conjunction with her twin sister Great Britain, was torn away from the arms of the mother continent; then the two sister isles were wrenched asunder, and Ireland was launched on her own independent existence.

The oldest part of the island is the highlands of Donegal, built up of crystalline rocks of primitive age.

These, as well as the mountains of Wicklow, were thrust up into ranges, or rather elongated groups of separate mountains, having a north-east and south-west axis, like the contemporaneous formations on the west side of Scotland and the west side of the Scandinavian peninsula.¹ The predominant formation in the south of Ireland is the Old Red Sandstone, which, after the Carboniferous deposits had been laid down, was crumpled into parallel folds stretching from east to west,—a stroke of ill-fortune from which Ireland suffers at the present day, for the softer rocks (coal-measures chiefly) which filled the hollows of the crumplings gradually weathered away, leaving the Old Red Sandstone ribs exposed. Where, as for example around Killarney, these have withstood the disintegrating influences, there Ireland possesses some of her finest mountain scenery. Amidst her many misfortunes this consolation cannot, at any rate, be taken from her.

The next geological formation in Ireland of any magnitude is the Tertiary basalts, which, in successive outflows, built themselves up into thick plateaux in the north-east, between Belfast Lough and Lough Foyle. Thus there is a great gap in the geological sequence of the Irish rocks, denudation having played a gigantic part in the interval.

The result of all these ups and downs of geologic life has been to leave Ireland with a surface which may be likened to a saucer framed about with a rim of higher, broken, mountainous ground. These loftier areas are, for the most part, especially conspicuous in the corners of the lozenge-shaped island, so that all the four provinces into which Ireland has been divided since Celtic times,

¹ Petrographically, there is a very close resemblance between the crystalline granites of Donegal and those of Norway.

Clack, Binnall, and Carrigrohilly, have their share in the ruggedness, and at the same time the grandeur and beauty, which these features impart.

The middle portion—the long, broad, shallow synclinal depression of the Carboniferous folding—is, for the most part, level, and green, and fertile, except where bogs have grown. The eloquent words in which the poet Spenser couched his description of Erin are as applicable to-day as they were more than three hundred years ago. In spite of all that has befallen her, “sure it is yet a most beautifull and sweet countrey as any is under heaven, seamed thoroughout with many goodly rivers, replenished with all sortes of fish, most abundantly sprinckled with many sweet Ilandes and goodly lakes, like litle Inland Seas, that will carry even ships upon theyr waters, adorned with goodly woodes fitt for building of howses and shippes, . . . also full of good portes and havens opening upon England and Scotland, as inviting us to come to them, to see what excellent comodityes that countrey can affoord, besides the soyle it self most fertile, fitt to yeeld all kind of fruite that shal be comitted therunto. And lastly, the heavens most milde and temperat, though somewhat more moyst then the part toward the West.”¹

2. Climate

Ireland is the first land in Europe to benefit by the south-westerly winds from over the Gulf Stream and the Gulf Stream drift. In some, though a moderate, degree, their effects are neutralised by the great extent of

¹ *A View of the Present State of Ireland*, written between 1580 and 1598, Globe ed. of Spenser's *Works* (London, 1879), pp. 616, 617.

the undrained bogs and morasses, and the general elevation of the central limestone plain. On the whole the climate is moist and equable; fogs and mists and drizzling rains abound, and the summers are cooler and the winters warmer than other countries between the same latitudes. The mean annual temperature at Dublin is 49° F., at Valencia in County Kerry 51° . At both the range of temperature is very moderate. At Valencia the mean of the coldest month is 45° F., about six degrees higher than that of London; that of the hottest about $59\frac{1}{2}^{\circ}$, or more than four degrees below that of London, but nearly the same as at Dublin. The weather is changeable, and squally winds by no means uncommon. The rainfall is more constant than in England, as well as heavier. This is due not only to the more insular position of Ireland, but also to the fact that for nine months out of the twelve the winds come out of the south and the west, charged with the humidity which they have sucked up from the Atlantic. The average amount of precipitation for all Ireland is about 38 inches annually, though the south-west and west receive from eleven to twenty-four inches more than this.

3. The Central Plain—Irish Bogs

The average elevation of the great limestone depression which occupies all the interior of Ireland is about 300 feet; and the plain, although diversified by ranges of hills, which, as in Slieve Bloom, run up to 1735 feet, and by numerous lakes, is on the whole so level that it is difficult to say there exists any decided watershed determining that this portion of the drainage shall go to the Atlantic and that portion to the Irish Sea. Bogs, dreary, melancholy, and often swampy, cover considerably

Bog of Allen, for instance, lies spread over a great part of King's County and Westmeath.

Anciently Ireland was plentifully planted with forests, traces of them having been found even on the top of the Mourne Mountains. In cutting turf the remains of countless oaks and firs have been brought to light. Indeed, the forests existed within quite recent times, as in 1652, when Gerard Boate wrote his *Ireland's Naturall History* (vide pp. 120, 121). In the early part of the same century there was an extensive trade in oak (pipe staves) to England. This, and the use of the timber for heating the iron-furnaces which, Boate tells us, were dotted all over the country, are between them accountable for the disappearance of many of the forests; though in some places the trees had been felled by the early English settlers, partly for the purpose of reclaiming the ground to cultivation, and partly because of the too ready refuge which they offered to outlaws and robbers. At the present time less than 2 per cent of the area of the island is classified as forest land.

The destruction of the forests has, of course, largely contributed to the formation of the bogs, which consist of mosses (chiefly *Sphagnum*) and other lowly vegetable forms that take root in stagnant pools and hollows, and go on decaying underneath and growing at the top, and always hold in suspension a greater or less quantity of moisture. The bogs on the great plain are known as red bog, in contradistinction to the less deep and drier black bogs which grow in the mountainous parts. The predominating colour is, however, a sombre brown rather than red; and it varies greatly in concentration and consistency. Whilst some bogs are sufficiently firm to admit of man and beast walking across them, others are

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as yet none has proved commercially successful.¹ It may here be noted, however, that quite recently the peat of North Germany has been utilised for the generation of electricity at certain central stations, whence it is distributed to neighbouring manufactories.

Like the mosses of Jutland, the peat-bogs of Ireland have stored up a multitude of evidences illustrative of the past—both the history and the physical conditions of the island. The museums of Dublin, in especial the museum of the Royal Irish Academy, contain splendid collections of these archæological treasures, including even human bodies, with the skin tanned brown, and the clothing they wore; ornaments in gold and amber, and tree canoes. The zoological remains embrace bones and skeletons of the gigantic Irish deer (*Megaceros Hibernicus*), the mammoth, reindeer, bear, wolf, hippopotamus, and various domestic animals.

The “bog oak” furniture of Dublin is made from oak timber dug out of the bogs. The bogs also yield iron.

Apart from the Liffey and the Boyne, the larger rivers which drain the central limestone plain flow towards the south. Of these the longest is the *Shannon*, over 250 miles in length, the last 60 miles of which have, however, a westerly course. This river drains an area of 4550 square miles, and is navigable from *Lough Allen*, near its source, to the sea, a distance of over 200 miles. Navigation is, however, interrupted by rapids and falls at Killaloe and Doonass, between Lough Derg and Limerick. In this portion of its course, about 17 miles, the stream falls close upon 100 feet; whereas between Lough Allen and Killaloe, a distance of 115 miles, its

¹ In London and Leicester, and also in Düsseldorf, a beginning has been made (1902) with weaving peat fibre into hosiery, making it into felt hats, wadding, clothing, etc.

fall does not exceed 35 feet, and here it expands into several lakes, the largest being *Lough Ree*, 16 miles long and swelling out to a maximum of 7 miles in width, and *Lough Derg*, 6 miles long by 4 broad. The country through which the river passes is flat and low, and its stream frequently overflows and inundates the adjacent bogs and pastures. *Lough Ree*, as well as *Lough Corrib* in Galway, and other lakes of the limestone plain, appear to owe, if not their origin, at any rate a good deal of their existing size and shape to the solvent action of water charged with carbonic acid on limestone. In this region, too, as in the Karst country of the Adriatic, there are not wanting examples of streams which flow for part of their courses in subterranean channels eaten through the limestone, *e.g.* the infant Shannon, the Claddagh, which helps to feed Upper Lough Erne, and the stream which connects Lough Mask with Lough Corrib. The southern portion of the great plain is drained by the *Barrow* and its sister stream the Nore, and by the Suir; but these, by reason of their origin, will be most conveniently discussed in the section descriptive of the south of Ireland. In addition to these there are a number of small streams, some going east, some north, as the Erne and the Moy.

But the uniform level of the central plain, and its great number of small lakes, have rendered it easy to construct artificial waterways. Two great canals cross Ireland from east to west, both starting from Dublin, and both entering the middle course of the Shannon—the *Grand Canal* at Shannon Harbour in King's County, the *Royal Canal* at Cloondara in County Longford. The highest point climbed by these canals is 324 feet in the latter; both were dug in the second half of the eighteenth century. The Grand Canal, which measures 166 miles

in all, has branches to several of the most important towns in the middle of Ireland, and is continued beyond the Shannon as far as Ballinasloe. The *Royal Canal*, which is a little short of 100 miles long, was bought by the Midland Great Western Railway in 1845.

The country between the river Boyne and the Wicklow Mountains, for about 25 miles west from Dublin, is one of the most favoured in Ireland, being fairly wooded, with numerous twinkling streams and pleasant farms and country seats. And rich as Ireland is throughout in pagan remains and architectural ruins, there is perhaps no district in the island so rich in both as the valley of the *Boyne*, nor, if we except Londonderry and Limerick, is any fraught with more pulse-quickenings historical associations. Here are the hill and halls of Tara, the ancient residence of the kings of Ireland; the pagan tumuli of Newgrange, Knowth, and Dowth; Armagh, Louth, Kildare, Kells (where St. Columba lived), Monasterboice, Mellifont,—which figure prominently in the ecclesiastical history of Ireland; the battlefields of the Boyne and Clontarf, and Drogheda, which still remembers Cromwell's savage siege and slaughter; the round towers of Kells and Swords and Donaghmore, of Kildare and Monasterboice; Teltown, Naas, the Hill of Allen—famous royal seats in the far-off days when Ireland had kings of her own; the castles of Trim, Malahide, Swords, and Carbury, and many others; to say nothing of the associations which recall the titanic figures of Dean Swift and the great victor of Waterloo.

Outside this favoured region, though more widely scattered, there exist a great number of similar memorials of the past, historical, artistic, architectural, and ecclesiastical. It must suffice to enumerate a few of the more outstanding, as the Hill of Cashel, where the kings of

Munster resided; the abbeys of Holycross near Thurles, Jerpoint near Thomastown, Boyle in County Roscommon, and Ross near Tuam; the large and remarkable cluster of ecclesiastical ruins at Clonmacnoise beside the Shannon; the strong castles of Carlow, Kilkea, Athenry, and Roscommon, whence the English sought to overawe the Irish; St. Patrick's purgatory on Iniscaltra Isle in Lough Derg; Maynooth and Carlow and Tuam, of importance ecclesiastically; the battlefields of Aughrim and Moytura; Athlone and Mullingar, both strategic points of some value; Pallas and Auburn (or Lissoy), recalling the life-story of Oliver Goldsmith, and Edgeworthstown, reminiscent of Maria Edgeworth and Walter Scott.

4. The North-East and the Coast of Antrim

The Carlingford Mountains (1935 feet) marked anciently the dividing line between Ulster and Leinster; and Moyry Pass, which threads them, was the scene of many a cruel fight between the rival kingdoms. The granite Mourne Mountains (2796 feet), which overhang Carlingford Lough on the north side, owe the boldness of their outlines, their craggy crests and rugged flanks, to their comparatively recent age. *Carlingford Lough*, as well as the other two large inlets of this coast, *Strangford Lough* and *Belfast Lough*, are, like the Norwegian fjords, submerged land-valleys.

The coast all round from Belfast Lough to Lough Foyle, a distance of 60 miles, is almost everywhere bold and rocky, and of singular and striking beauty. Its characteristics are well described by J. G. Kohl, a very intelligent German traveller of keen and well-trained observation, who visited Ireland a few years before the great famine.

“Along this whole district the white chalk rocks [the rocks of the Cretaceous era over which the eruptive basalt was poured] and the black basaltic formations are found arranged in the most curious, picturesque, and diversified forms. Sometimes the chalky mass lies in regular strata, and the basalt is poured over it in similar strata. Elsewhere the limestone has remained untouched by the basalt, and projects its white cliffs as proudly into the ocean as once into the glowing furnace of the volcanic liquids. Here and there, however, they vanish under the surface of the sea, and the basalt rears itself above them, sometimes in regular columns, and sometimes in irregular masses. In some places the basalt forms long aisles or avenues of thick and lofty columns; in others yawns open in deep black caverns and caves; in others projects bold precipices over the raging waves, or breaks up into sharp fragments, forming little rocks and precipitous islands. Elsewhere the limestone and basalt seem to have struggled with one another for supremacy, and their colours and materials seem mixed together in inextricable confusion. . . . Here and there the land rises into high points, some of which are nearly 2000 feet high; and here and there it sinks, forming valleys which extend along to the sea, and break the high rocky line of the coast. . . . Many rocks and headlands are from one to two thousand feet in height, but their usual elevation varies from 600 to 1000 feet.”¹

The valleys to which Kohl alludes—Glenarm, Glenariff, Cushendall, Cushendun, and others are famous under the name of the Glens or Glynns of Antrim, the ground of their fame being their wild and yet luxuriant beauty. At Glenariff the Old Red Sandstone crops out and frowns down upon the narrow seas in magnificent sections.

¹ *Ireland, Scotland, and England* (London, 1844), pp. 214, 215.

Caverns and subterranean passages, many of them indicating an ancient sea-beach, traces of which reach as far down as Dublin, abound in this locality, and the shore-line is in several places littered with the rocky débris of gigantic landslips. Along this portion of the coast a magnificent road has been cut shelf-wise at the very edge of the sea.

The beautiful and marvellously symmetrical columnar structure of the basalt is splendidly shown in that ancient "wonder of the world," the Giant's Causeway, and in almost equal perfection on the multiple-headed promontory of Benmore or Fair Head, and indeed all along the north coast from that promontory to Lough Foyle.

The majority of the columns of which the *Giant's Causeway* consists measure from 12 to 15 inches in diameter, the rest being thicker, and each column consists not of one block (monolith) of basalt, but of a number of separate blocks, 6 to 12 inches high, and fitting exactly one upon another. And, very curiously, the seam or plane of fracture does not go right through the column, but at every angle a clamp or clasp of living rock passes unbroken from the one block to the other.¹

The coast consists of a series of alternate bays and headlands. The former, deep and rounded, are lined out with basalt columns, disposed in tiers after the plan of the Roman amphitheatre; the latter, varying from 250 to 400 feet in height, show some of the most fantastic and imposing designs Nature has sculptured anywhere on the British coasts. Man, not satisfied with the natural defences of this rock-bound shore, has crowned several of the bolder and less accessible headlands with his strongholds. Dunseverick and Dunluce, two ruined castles, are perched each on the

¹ Kohl, *op. cit.* p. 235.

summit of a giddy pinnacle of rock, which stands detached from the mainland, a drawbridge having spanned the gaping abyss between.

Off this coast lies the wind-swept, storm-vexed island of Rathlin, on which Robert Bruce found an asylum in the darkest days of his adversity.

Behind this bold coast the surface rolls away in wide, open downs, which in part merge into the Antrim plateaux, in part sweep up to the hills of Londonderry or the still higher Sperrin range (2240 feet) on the border of Tyrone. Here lies *Lough Neagh*, the most extensive—it measures 18 miles by 11, and covers 155 square miles—sheet of water in the British Isles. Its shores are low and flat, and in many places marshy; and its depth inconsiderable, the average being 20 to 40 feet, the maximum just over 100 feet. Its origin, due to a subsidence of a section of the basalt plateaux, is perpetuated in the tradition which is alluded to in Moore's well-known lines, "Let Erin remember the days of old"; the lake lies only 48 feet above sea-level. Its waters are navigable, and drain off to the north by means of the river Bann; and its utility for the purposes of navigation is increased by the Newry Canal, $22\frac{1}{2}$ miles long, and navigable by vessels drawing 15 feet, which connects the Bann at Portadown with Carlingford Lough; by the Ulster Canal, 48 miles long, which provides a waterway to Upper Lough Erne; and by the Lagan Navigation, which links the lake with Belfast by means of the river Lagan.

Half a dozen favourite seaside resorts stud the Down and Antrim coasts, namely, Warrenpoint and Rostrevor, on Carlingford Lough; Newcastle, at the seaward foot of the Mourne Mountains; Ardglass, once the principal port of Ulster; and Downpatrick, which formerly guarded the bones of St. Patrick, St. Columba, and St. Brigid—both

on the Ards peninsula ; Bangor, where the Royal Ulster Yacht Club hold their annual regatta, and where in early days there existed a famous monastic school ; and Portrush, on the north coast, which attracts golfers as well as summer tourists.

The inhabitants of the region which lies east of a line drawn from Dundalk through Armagh, Dungannon, Omagh, and Strabane to Londonderry are for the most part, though not entirely, of Scottish descent, planted here in the reign of James I. They are Presbyterians by religion, and are principally engaged in growing flax, preparing it for manufacture, spinning it or weaving it, and bleaching it when manufactured. This part of Ulster wears an air of greater prosperity, comfort, and good order than any portion of Ireland outside of the principal cities and the environs of Dublin.

5. The Donegal Highlands and the North-West

This, the oldest part of Ireland, presents many striking points of similarity with Norway. The north-east and south-west axes of the mountain ranges, the narrow, but deep trough-like indentations of the coast, the ribbon-like lakes, the moraine débris, the rounded summits of the individual mountains, and other evidences of glacial action abound throughout Donegal as they do in Norway, though, it is true, not on the same scale of overwhelming magnitude.

The most prominent of the Donegal ranges, though they are elongated groups of separate elevations rather than ranges, are the *Derryveagh Mountains*, the giants of which are the steeply scarped Errigal (2465 feet), Slieve Snaght (2240 feet), and Muckish (2200 feet). Parallel with them and separated from them by the fine Highland

glens of Gweebarra and Glen Veagh, are the Glendowan Mountains, 200 to 800 feet lower.

Although Donegal possesses some of the most interesting coast and mountain scenery in the British Isles, it was, until recently, almost as little visited by English and other tourists as the dune resorts of the Frisian islands. This was almost entirely owing to the lack of quick and easy means of communication and the absence of suitable hotels. But a great change has been effected of late years in both respects. Several of the roads wind through scenery which recalls vividly the Scottish Highlands, and traverse fine highland passes, *e.g.* Barnesmore Gap (538 feet), through which runs the light railway (1895) from Stranorlar to Donegal; Glengesh (900 feet) between Ardara and Carrick; and the Gap of Mamore (760 feet) on the west side of Inishowen Peninsula, through which a railway from Buncrana to Cardonagh was opened in 1901. Lough Veagh, in the Glen Veagh, already mentioned, "is regarded by many as the finest lake in Ireland as regards scenery. It is about 4 miles long. The lower part approaches Killarney in beauty, and the upper part surpasses it in grandeur. The mountains rise directly from the water's edge to a height of over 1200 feet, with just enough slope to enable them to be covered with Alpine vegetation."¹

The northern coast is indented by several deep bays or fjords, very ragged in outline, and separated from each other by lofty and precipitous rocky headlands or peninsulas. Lough Foyle is divided from Lough Swilly by the high and swelling peninsula of Inishowen, Lough Swilly from Mulroy Bay by Fanad Peninsula (1200 feet), Mulroy Bay from Sheep Haven by Rosguill peninsula,

¹ Mr. J. Cooke, *Murray's Handbook for Ireland* (London, E. Stanford, 1902), p. 192.

and Sheep Haven is sheltered from the Atlantic by the rugged double promontory of Horn Head (625 feet).

On the west coast the indentations are shorter, but the coast-line as a whole is extremely irregular and broken, and in several localities is overhung by steep mountains. The sea-cliffs of Slieve League plunge into the waters of Donegal Bay by a sheer descent of close upon 2000 feet; indeed the cliff scenery thence all the way round to Loughros Bay is remarkably fine. Further, the west coast of Donegal is beset by a continuous scattering of small islands, most of them rocky and repellent, Aran and Tory being the largest.

The archæological remains and historical associations of this quarter of Ireland are appreciably fewer than in the ancient kingdom of Meath, or even in the east of Ulster. But Glencolumkille preserves traditions of St. Columba; and Tory Island possesses a round tower and other antiquities, and plays a part in the ancient legends of Ireland. But Donegal possesses other attractions in her fishing-streams and new golf links, such as Gweedore and Rosapenna. Moville and Buncrana, on opposite shores of Inishowen, are favourite seaside resorts.

6. Connemara and the West

Connemara typifies, on a small scale, what Ireland is on the larger scale: it is the backward region of the west. Towards the middle of the nineteenth century it was described by Sir Robert Kane¹ as being "the reproach of Ireland and the by-word of Great Britain," and this despite the fact that it possessed "some of the sweetest pastures and most productive lands" in the country, despite the fact that its coasts abounded in fish

¹ *Industrial Resources of Ireland* (London, 1844), p. 344.

and its mountains in ores, despite the fact that its people were willing to work and travelled hundreds of miles in search of it, and accepted work "at a rate which only allowed them to sustain existence." "Little more than one-half of its area has been [in 1844] made available for cultivation, and it is but a few years since its interior was first rendered accessible to industry by the formation of proper roads."

The eastern part of Connaught belongs to the central limestone plain; the line of separation between the latter and the mountainous regions of Connemara and western Mayo is indicated by the chain of lakes—Conn, Cullin, Carra, Mask, and Corrib—which stretch from Killala Bay to Galway Bay. Lough Corrib, the largest, although 27 miles long and 7 wide, is so shallow (3 to 30 feet deep) that it is only navigable by large barges. Lough Mask, 10 miles long by 4 wide, lies 36 feet above Lough Corrib, and the latter lake has a fall of 14 feet to Galway Bay. Loughs Conn and Cullin exhibit the peculiarity of alternately ebbing and flowing into each other.

The mountains of western Connaught are built up principally of granite, though some of them, as *Croagh Patrick* and the Twelve Pins, are constructed of quartzite. The former, called also the Reek (2510 feet), is a steep isolated mountain overlooking Clew Bay and its hundreds of pinnacled island rocks; owing to its association with St. Patrick it is visited every July by great numbers of Irish pilgrims. The *Twelve Pins* or *Bunnabeola Mountains* range from 1900 feet to the culminating peak of Benbaun (2395 feet), and as they rise from a base which is little more than 100 feet above sea-level, their apparent height is even greater. Almost immediately to the east of them is another scarred and rugged group known as the

Maamturk Mountains, several summits of which exceed 2000 feet. These two groups are separated by a highland glen very similar to Glen Veagh in Donegal; it owes its origin to glacial erosion, and is in great part occupied by a string of narrow lakes—Ballynahinch, Derryclare, and Inagh. The north-west of County Mayo is dominated by the Nephin Beg Mountains, which reach 2345 feet. The district in which they stand abounds in the conformation known to geologists as rag and tail, an evidence of glacial activity in a far distant past. In the south-west corner of the same county there is another cluster of commanding giants—Muilrea (2690 feet), Benbury (2610 feet), and Bengorm (2305 feet).

Notwithstanding the host of small streams which filter out of as many tiny lakes and thread the mountains in all directions, and in spite of the abundance of ferns and heaths, some of them of great rarity, which grow among the mountains, the aspect of the country is extremely sombre and melancholy. This is owing to the great extent of bog, to the arrested "tides" of boulders, the brown moors, and the great expanses of bare rock. The bog—the black *mountain bog* of Ireland—not only fills the valleys, but climbs far up the mountain sides, all over the townless, treeless, and often roadless expanses of Connemara and western Connaught. And the mean, poverty-stricken huts of the peasantry, built of loose stones and covered with peat, which shrink against the hill-sides at wide distances apart, do but add to the forlorn desolation of the scenery.

The whole stretch of coast from Killala Bay round to Galway Bay forms a noble panorama of broken bays alternating with imposing sea-cliffs and bold headlands, backed by the stern and gloomy mountains behind. Broadhaven, Blacksod Bay, Clew Bay, Mannin Bay, and

Kilkieran Bay are the largest inlets. Killary Harbour, a narrow sea-trough cut 9 miles deep into the heart of the mountains, is the most realistic specimen of a Norwegian fjord which is to be found on the west coast of Ireland.

The rugged mountain and cliff scenery of this coast is continued in the numerous islands which serve as its bulwark against the Atlantic, more especially the large islands of Achill, Clare, and the Aran group.

Achill Island, 15 miles by 12, separated from the mainland by a sound only half a mile wide, shoots up to 2200 feet in Croaghnaun, the western face of which plunges some 2000 feet straight into the ocean. Numerous cromlechs, cairns, tumuli, and other archaeological remains still survive on the island. The inhabitants of these western isles are amongst the most poverty-stricken in Ireland. The climate is moist, and the Atlantic gales blow with such violence that trees utterly refuse to live except in perfectly sheltered spots. According to Irish legend, the stony Aran group were the last retreat and refuge of the Firbolgs, one of the semi-mythical races who inhabited Ireland at a remote antiquity. And *Inishmore*, the largest, certainly does abound in duns or stone forts, one of which, Dun Ængus, is one of the most remarkable barbaric monuments in Europe outside of the Mediterranean region. It stands on the verge of the sea-cliffs, nearly 300 feet above the sea, and consists of three cinctures of stone walls, arranged in the shape of a horseshoe, all of massive proportions, the innermost being 18 feet high and $12\frac{3}{4}$ feet thick. These islands were also in ancient times the seat of a famous monastic school, and were visited, as they still are, for the performance of devotional exercises and austerities.

County Clare, which fills the gap between Galway Bay and the estuary of the Shannon, is reckoned politically to Munster, but geographically, socially, and economically should be treated along with the west of Connaught. For although its eastern part belongs to the great limestone plain, the portion west of the river Fergus presents to the Atlantic a continuation of the same torn and lacerated line of high cliffs which we have travelled along all down the west coast of Ireland. The most imposing stretch of the coast of County Clare is the *cliffs of Moher* (670 feet high).

In this section the most noteworthy places possessing archæological or historical interest, in addition to Achill and the Aran Islands, are the abbeys of Quin and Ballintober (near Westport); Ennis, an ancient seat of learning; Cong, famous for its abbey and stone cross; Scattery Island, in the Shannon estuary, hallowed by the memory of St. Senan and several generations of the Irish dead; the semi-legendary battlefield of Moytura near Cong, where the Firbolgs are said to have been vanquished; and Killala and Castlebar, which figured prominently during the French invasion of 1798. Lisdoonvarna is visited for its mineral waters, Lahinch for its golf, and Kilkee with its fine sandy beach and chalybeate springs, as a seaside resort.

7. Kerry, Cork, and Waterford

The geological origin and structure of this region were indicated in the opening of this chapter. "The Reeks of Kerry, the brown and purple masses of Killarney, the bare and gray rock walls that look down on so many romantic valleys of the west, result from the exposure of the lake deposits of Devonian times. The terraced

structure of the original stratification, bed upon bed, is characteristic of these mountain-sides, and is seldom more clearly seen than in the neighbourhood of Derrynane and Waterville,"¹ both at the extremity of the Killarney-Valencia promontory.

The east-west direction of the great earth-folds in the south of Ireland have, in the main, determined the direction of the rivers—Bandon, Lee, Blackwater, Suir. The sharp deviation which they make to the south a few miles before they enter the sea is accounted for by the fact that, before the great foldings took place, the principal streams flowed from north to south; but as the east-west synclines, or hollows of the foldings, became worn away and scooped out by erosion, the rivers experienced increased difficulty in getting across the anticlines or ridges. Hence, as those amongst their affluents which came down the deepening valleys acquired more and more power, they tended to supplant the mother-streams, and eventually caused the upper parts of these latter to dwindle away. But when the main stream got beyond the last anticlinal barrier, it reasserted its original direction, and continued straight on southwards to the sea.²

The dominating feature of County Derry is the well-marked series of mountain ranges which stretch from the boundary of Cork westwards to the extremity of the peninsula separating Kenmare river from Dingle Bay. The culminating point of these mountains, which are known successively as the *Paps*, *Mangerton*, *Tomies*, *Purple Mountain*, *Macgillicuddy's Reeks*, and others, is

¹ Grenville A. J. Cole, "The Topography and Geology of Ireland," in *Ireland, Industrial and Agricultural* (Handbook for the Irish Pavilion, Glasgow International Exhibition), 1901, p. 8.

² This is the theory of Prof. Jukes, in *Quart. Journ. Geol. Soc.* (1862), vol. xviii. pp. 378-403.

Carrantuohill, or more shortly *Carntual*, 3415 feet in the last-named. Another range, with many peaks reaching 2700 feet to 2800 feet, whilst one or two exceed 3000 feet, forms the backbone of Dingle Peninsula, and terminates at Brandon Head and Sybil Head in steep cliffs 700 to 1000 feet above the Atlantic. Another mountain backbone or rib separates Kenmare river from Bantry Bay, and reaches 1885 feet.

The celebrated lakes of Killarney, with their picturesque islands, promontories, and ruined buildings, lie in a deep highland basin of the first-mentioned ranges. There are three lakes; the largest Lough Leane (or the Lower Lake), a sheet of water 5 miles in length by half as much in width, is dotted with some thirty islands and islets. The charm of these lakes is due to the blending of mountain and lake, wood and running water, and owes no small measure of its effect to the wealth and variety of the vegetation. The *Arbutus Unedo* is indigenous here, and ferns grow in great profusion. The gleaming scars on the mountain sides peep out of a smother of greenery, and their feet trail it after them as they dip into the waters below; and where the woods fail, their place is taken by an emerald setting of soft green grass. The waters which gather into these mountain reservoirs are carried into Dingle Bay by the river Laune.

The contrast is forcibly sharpened when one journeys through the interior of the county, and continues on through the middle of County Cork; the prevailing characteristics of all this region are a stony, treeless waste, tinted dull gray, furrowed here and there by an open, shallow stream, dotted with patches of heath, and seamed with an occasional wooded ravine.

In the south of Cork the many bays and inlets, and

sheltered glens to which they open a path for the sunshine and soft breezes, present a contrast of a different character. The most favoured of these sylvan paradises is, perhaps, Glengarriff at the head of Bantry Bay; another is Parknasilla, on Kenmare river.

The determining features of County Waterford are the Old Red Sandstone ranges of the *Knockmealdown Mountains* (2610 feet) and the *Comeragh Mountains* (2475 feet), and the river Suir and the estuary it forms conjointly with the Barrow and the Nore. All these are only navigable for short distances in their lower courses, the Suir as far as Clonmel.

The coast of the south of Ireland from the mouth of the Shannon to the mouth of the Barrow abounds everywhere in noble bays and inlets, forming safe and spacious harbours, with good anchorages and protection against both wind and sea. Tralee and Dingle Bays, Kenmare River (really a bay), Bantry Bay, Dunmanus Bay, and the smaller Roaringwater and Baltimore (or Skibbereen) Bays, followed by the harbours of Kinsale, Cork (or Queenstown), Youghal and Waterford—these are the most noteworthy. In 1901 the British Admiralty resolved to create a new naval base for the Channel fleet at Bearhaven¹ in Bantry Bay; they already possess a depot in Queenstown harbour. There are also numerous small rocky islands around the entrances to the bays, of which Valencia is memorable as the starting-point of the earliest (1857, 1858, 1865, 1866) and some subsequent trans-Atlantic cables. About 10 miles south-west of Valencia Island is the island shrine of St. Michael, for centuries a place of penitential pilgrimage. The rock which it crowns, one of the Skelligs, rises to a height of

¹ There is also a project for making Bearhaven the terminus of a new Atlantic mail steamer route.

550 feet, and penance is performed on the giddy spiral which leads to the top, and on a still more giddy platform of rock which literally juts out over the abyss.

This part of Ireland again abounds in places of interest. Archæologically—the ecclesiastical ruins of Buttevant, Ardmore, Gouganebarra, Timoleague, Smerwick, Adare, and Monasteranenagh, the castle and famous “kissing” stone of Blarney, the decayed town of Fethard near Clonmel, Kilcrea Castle near Cork, the massive walls of Staigue Fort in the Killarney-Valencia peninsula (which have much in common with Dun Ængus on Aranmore), and the stone circles of Lough Gur, a stronghold of the Desmonds. Historically—Mitchelstown, with its caves and memories of the “Plan of Campaign” against eviction; Youghal, with which are associated the names of Raleigh, Richard Boyle Earl of Cork, Oliver Cromwell, and others; Kinsale, which the Spaniards seized in 1601; Bantry, which the French conceived a particular regard for in 1689 and again in 1796; Tralee, the chief seat of the Desmonds; Dingle, with its traces of Spanish influence and a host of antiquarian remains of all kinds; and Kilmallock, a stronghold of the Elizabethan English. St. Brendan, the monkish explorer of the waste Atlantic, is associated with the head of the Dingle peninsula; as the poet Spenser is with Kilcolman Castle, Bishop Berkeley with Cloyne, Laurence Sterne with Clonmel, and the dramatist Congreve and Edmund Spenser with Lismore. Tramore (near Waterford), Kenmare, Parknasilla (near Kenmare), Waterville, are visited for sea-bathing, and Glencar near Dingle Bay for fishing. Mallow on the Blackwater was once a fashionable spa.

8. Wicklow and Wexford

On the south-east the central limestone plain is flanked by the Mountains of Wicklow, a mass of granite thrust up and crumpled at the close of the Silurian epoch, and subsequently deeply trenched and scarred by glacial action. The mountains, which culminate in *Lugnaquilla* (3040 feet) and *Kippure* (2475 feet), stretch



THE VALE OF AVOCA.

Lawrence, photo.

from Dalkey near Kingstown to the confluence of the Barrow and the Nore, and are pierced by many beautiful, well-wooded *glens* from the south-east. Of these the best known are the Dargle, Glencree, Glen of the Downs, the Devil's Glen, Glenmacnass, Glendalough, Glendasan, Glenmalure, and Vale of Avoca (or Ovoca). The last named is the gem of this part of Ireland in respect of natural beauty. "Beautifully picturesque groups of oaks

and beeches, everywhere hung with ivy, constitute one of the main beauties of the vale of Avoca. This, to some extent, is the character of all the valleys of Wicklow through which rivers flow, while the summits of the mountains and the unwatered vales remain completely bare.”¹ With Glendalough is inseparably associated the fame of the holy St. Kevin. Right through the heart of this rugged mountainous district a fine road was driven about the period of the 1798 rebellion; it stretches from near Dublin to the neighbourhood of Rathdrum. More than one-fourth of County Wicklow is mountain bog and waste; but the rest affords excellent grazing, and the mountains, iron, copper, gold, and other minerals. The county of Wexford is, on the whole, tolerably level, and of great fertility; and being divided into a number of small estates, its inhabitants, Protestant and Roman Catholic alike, dwell together in peace and prosperity, untouched by the frothy sea of politics which churns incessantly around them. And what Wexford is to Ireland, that the district of the *barony of Forth*, or the extreme south-east corner, is as compared with Wicklow. Here the peasantry, of Welsh descent, dwell in good and clean houses, and eschew rags—a result of “the magic of property,” and a powerful plea for peasant proprietorship, of which more lower down. The county is drained by the Slaney, which forms a wide but shallow bay at its mouth.

The coast is formed “of a low-lying bluff shore and sandy strand of a most inhospitable nature, offering no shelter but the harbours of Wicklow and Arklow, . . . and a range of shoals or sand-banks flanks the greater portion at a distance of several miles.”² The coast on

¹ Kohl, *Ireland*, p. 130.

² J. Cooke, *Handbook for Ireland*, p. 272.

each side of Carnsore Point, the south-east extremity of the island, is an expanse of barren sand. Indeed farther west, the old sea-port of Bannow lies completely buried underneath the sand.

The largest and most beautiful ruin in the county of Wexford is Dunbrody Abbey, on the east side of the Barrow estuary; whilst at Glendalough there are a round tower and several remarkable ecclesiastical ruins. Wicklow, one of the Danish settlements, New Ross, Ferns, and Arklow possess historical associations; Ferns having been a seat of the kings of Leinster, and New Ross a former rival of Waterford, and like Wicklow a stronghold of the English. At Arklow the rebellious peasantry suffered a crushing defeat in 1798, and a few days later they were again routed at Vinegar Hill near Enniscorthy. Dalkey was strongly fortified in the Middle Ages and preceded Kingstown as a landing-place for travellers from England. Bray has grown rapidly into one of the most frequented seaside resorts in Ireland.

CHAPTER XXXIII

IRELAND—INDUSTRIES

ALTHOUGH in Ireland agriculture is the leading industry in a much greater degree than in any other member of the United Kingdom, and on that ground is all the more entitled to the first place in treatment which has been accorded to it in England and Scotland, it will nevertheless be more convenient in this case to consider agriculture last, inasmuch as the condition of that industry is of the first consequence in relation to the prospects of Ireland in the immediate future, which forms the subject of the next chapter.

1. Manufacturing Industry

Notwithstanding her abundant water-supply, the richness and variety of her natural resources, her many splendid ports and harbours, and her cheap labour, Ireland, for want of her lost coal-measures, is not likely ever to be a great manufacturing country. Though what things can be achieved with water, which will generate electricity, may be seen in Norway, in Sweden, in Bavaria, in Würtemberg, in North Italy, and elsewhere. Moreover, coal can be brought comparatively cheaply to most of the Irish coast towns. And there

are the possibilities of the peat as a source of power. So that altogether there is at any rate no lack of hopeful conditions. The only really extensive manufacturing industry of Ireland at present is that of linen; though there are many other more or less busy branches, as the making of woollens, brewing and distilling, and ship-building.

Yet Ireland was not always a country of one or two industries. In the seventeenth century she possessed a number of small *iron-works* scattered over several regions, and smelted and exported iron to London.¹ But the industry was killed partly by the improvident exhaustion of the forests, whence the charcoal was obtained for the furnaces, and partly by the English Navigation Acts. Ireland was also once the seat of a flourishing woollen manufacture. There is evidence of a trade in woollens between Ireland and Nantes as early as the sixth century, and in the fourteenth Irish serges enjoyed a good repute in Italy. A great impetus was given to the manufacture in 1667 by the Duke of Ormonde, who planted a colony of 500 Walloon families at Clonmel, and yet other colonies of the same people settled at Kilkenny and at Carrick-on-Suir. But their progress soon excited the jealousy of the English manufacturers, and in 1698 the latter persuaded Parliament to prohibit absolutely the exportation of Irish woollens. As a consequence of this injustice, Dean Swift tells us, 12,000 families were thrown out of employment in the neighbourhood of Dublin, and 30,000 in other localities in Ireland. Since the beginning of the eighties (nineteenth century) there has been an encouraging revival of this industry, and at the present time there are several

¹ Fuller particulars may be read in Gerard Boate, *Ireland's Naturall History* (London, 1652), pp. 125-140.

flourishing mills in different parts of the country, *e.g.* at Foxford in County Mayo ; at Blarney, Bantry, and Douglas in Cork ; at Caledon in Tyrone ; at Convoy in Donegal ; at Athlone, Tralee, Galway, Navan, Lucan, and two or three other places. Dublin still maintains her pre-eminence for poplins, an industry first planted in the city in 1693 by Huguenot refugees, but she laments the blindness of fashion. About 1883 a London lady, Mrs. Ernest Hart, very successfully revived the old cottage or home handicrafts—knitting, spinning and weaving of homespuns, lace-making, etc.—in remote Donegal, Derrybeg on the west coast being her chief centre. These industries now flourish in several other parts of the country, notably at Ardara, at the head of Loughros Bay.

Formerly Ireland did a considerable amount of *paper-making*, the mills standing pretty thick on the banks of the Lee and the Dodder (in County Dublin). Cork and Waterford were formerly famous for their glass. But this is now a defunct industry, like the dial-plate and brush-making of Dublin, the manufacture of leather and goods made from leather, of cottons and sail-cloth, of gold and silver lace, of hats, gunpowder, cutlery, brass and copper ware, and goldsmiths' work. Not all of these were stifled by Act of Parliament, though most of them were ; some died owing to a strange reluctance of the Irish themselves to train up apprentices.¹ Balbriggan, it should be stated, has been famous for its fine *cotton hosiery* for close upon 150 years, the industry having been started there in 1761-65. *Distilling* is carried on at Belfast and various other places in Ireland, Irish whisky enjoying almost as great a repute as Scotch. The porter and stout of Dublin have long

¹ See Robert Dennis, *Industrial Ireland* (London, 1887), pp. 6, 7, and other passages.

enjoyed a world-wide reputation, and brewing is carried on in most of the larger towns. Belfast possesses almost a monopoly of *ship-building* in Ireland, but there vessels of the largest size and the best type are constructed. In the same city tobacco, ropes and cables, and various other commodities are manufactured, and bacon and hams are cured. Londonderry carries on pretty much the same industries as Belfast, setting aside the special linen industries of the latter. Within recent years extensive manufactures of bicycles and agricultural implements have been growing up at Wexford. Porcelain is made at Belleek, near Ballyshannon.

But *the* manufacturing industry of Ireland is beyond question the *spinning and weaving of linens*, an industry which is confined entirely to the province of Ulster, and concentrated, for the most part, in and around Belfast, though there exist flourishing mills at Lisburn, Portadown, Ballymena, Londonderry, Bessbrook, Coleraine, and other towns. This industry was first fostered in Ireland, that is to say, in Ulster, as compensation for the forcible closing of the woollen mills, a Huguenot refugee, named Crommelin, being induced by William III. to settle at Lisnagarvey (now Lisburn). During the American Civil War the manufacture of Irish linen received a great and sudden impulse, and expanded with extraordinary rapidity; but the period of excitement was succeeded by a sharp relapse, followed by a long decline. Nevertheless the linen trade of the province is estimated to amount at the present time to twelve millions sterling annually.

Irish linen owes its superior excellences of perfect softness and purity in no small degree to the bleaching, which again depends upon qualities of water and atmosphere which are not easily obtainable elsewhere. For

instance, Bielefeld, one of the chief centres of the German linen industry, buys Irish yarn, sends it to Bohemia to be woven (Bohemian labour being cheaper than German), then sends it back to Belfast to be bleached, and when it once more gets back to Germany sells it in Berlin as Bielefeld linen with the Irish bleach.¹

It has of late been pretty generally recognised that the wellbeing of the poorer districts of Ireland does admit of being appreciably advanced by encouraging what are called the home industries, and by diffusing technical instruction in spinning and weaving homespuns, in knitting, lace-making, and embroidery. Several varieties of Irish lace are made, some of them of the highest delicacy, elegance, and refinement of taste. Limerick, Carrickmacross, Cork, Youghal, Kinsale, Crosshaven (near Cork), Clones, and Ardara are the principal seats of this industry. The home woollen industries, for which the women of Ireland show great natural dexterity and aptitude, flourish, as already mentioned, in County Donegal, but also in Connemara and County Kerry. Embroidery is especially prosecuted around Belfast, in Dublin, at Dalkey, Garryhill (County Carlow), Turbotstown (County Westmeath), Sligo, Ardara, Strabane, Ballintra (County Donegal), and a few other places. In addition to the above, instruction is also given in the building of fishing-boats, in barrel-making, in carpentry, carpet-making, basket-making, and so forth.

2. Minerals

Although Ireland was deprived æons ago of the bulk of her coal deposits, nevertheless fragmentary patches

¹ See *British Consular and Diplomatic Reports*, annual series, No. 1977 (1897), p. 7.

still survive in some half a dozen localities. The largest deposit is that of the Castlecomer or Leinster coalfield, a high synclinal basin between the valleys of the Barrow and the Nore. The coal here, as everywhere else in the south of Ireland, is anthracite; whereas in the north it is almost entirely bituminous. These beds have been long worked on a small scale, and the upper and thicker layers are already exhausted. Thin seams, not commercially payable, occur in the north-west of Cork, in the north of Derry, and in County Clare. Near Lough Allen (at Arigna) patches of coal cap the tops of hills of low elevation. At the south-west corner of Lough Neagh the coal-measures exist in relatively thick veins (2 to 9 feet thick), but appear to be of limited area. Other veins crop out on the Antrim coast, in the face of the sea-cliffs on both sides of Fair Head. In this locality a long gallery and chambers, containing mining tools, baskets, candles with rag wicks, and wheel-barrows made of basalt, were discovered in 1770, conjecturally survivals of mining efforts by very ancient or even primitive man. The total output of Irish coal averages 110,000 to 140,000 tons annually.

The *iron-ore* which was smelted in the seventeenth century iron furnaces (already mentioned) was partly bog iron-ore, partly ore got from iron-stone, this last occurring in many districts of the north, and in the west and south of the great central plain. At the present time a few thousand tons of the former are produced, almost entirely in County Donegal, and about 100,000 tons of the latter, all of it in County Antrim. Antrim also supplies annually some five to twelve thousand tons of *bauxite*, a hydrous aluminium oxide from which aluminium is manufactured; this being the only source of supply of this mineral in the United Kingdom.

Other ores, such as copper, lead, and zinc, are also extracted intermittently and on a small scale. *Copper* was formerly mined at several places in the south of Ireland, the prevailing form of the ore being pyrites. The activity of the Cronebane mine in the vale of Avoca in the years 1787-1811 is commemorated in the great number of copper tokens which were once in circulation in Great Britain and Ireland. The Ballymurtagh mine, in the same locality, has been worked for considerably over a century, and still yields both iron and copper pyrites. The veins at Bonmahon near Dungarvan, breaking out in the face of the sea-cliffs, were worked in ancient times. Mining was actively carried on at Allihies and various other places in County Kerry in the first half of the nineteenth century; and from one mine close to Killarney over £80,000 worth of copper-ore was raised in the years 1749-54. In 1836, again, 21,819 tons of copper-ore were raised in Ireland, and sold in Swansea for £163,864. *Lead* is widely distributed throughout the country, mostly in the form of galena. Veins have been worked at different times in Glenmalure and Glendalough in County Wicklow, in County Antrim, at Kenmare in Kerry, at Silvermines in Tipperary, and in County Clare; but all these are now practically abandoned. *Zinc*, in the form of blende, was a common associate of lead and copper, and in the Wicklow district occurs in conjunction with the iron pyrites. From the number of ancient gold ornaments discovered in Ireland, gold is believed to have been once found pretty plentifully. From about the close of the eighteenth century considerable quantities of alluvial gold have been obtained in the vale of Avoca and on the northern flank of Croghan Kinshelah in County Wicklow. *Rock-salt* exists in thick beds near Carrickfergus in Antrim, and has been mined since 1850,

the annual output being 40,000 to 50,000 tons. Gypsum mines are worked near Carrickmacross, and barytes near Bantry and near Bundoran. Ireland is, however, rich in building stone, especially in fine sandstone (Donegal), limestone (Ballinasloe), marble, especially black (Galway and Kilkenny), red (Cork), and green (Ballynahinch and Lissoughter in Connemara), granite (Newry, Donegal, Galway, and Wicklow), and dolerite (Rostrevor and Arklow). The value of the total mineral output of Ireland, including building stone, amounts to between £200,000 and £250,000 annually.

3. Fisheries

Until quite recently the Irish fisheries were woefully neglected, although several varieties of fish—mackerel, herring, cod, ling, hake, sole, turbot, plaice, haddock, whiting, sprats, lobsters, periwinkles, and oysters—frequent more especially the south and west coasts. On the west coast the fishing-banks do not stretch far from shore, owing to the rapid descent of the submarine plateau on which Ireland stands; but on every other coast they reach far out to sea. In the fifteenth and sixteenth centuries these fishing grounds were worked by the Spaniards, the Dutch, and to a smaller extent by the French. The Irish do not seem to have busied themselves to any extent with sea-fishing before the early years of the nineteenth century; but from then until the year before the great famine Ireland built more than one fine fleet of fishing boats and bred up a hardy race of fisher-folk, so that in 1846, the last flourishing year of the industry, her fisheries gave employment to 19,833 vessels and boats, manned by 130,073 men and boys.¹ After 1846 Irish

¹ *Report of the Recess Committee* (London, 1896), p. 30.



out the following percentages of occupations in 1841 and 1891 :—

	Agriculture.	Dealing.	Domestic Service.	"Others."
1841 . .	50·9	2·6	9·4	4·1
1891 . .	43·7	5·4	12·2	2·6

The general high fertility of the soil of Ireland is universally admitted. Its prevailing character is a productive loam, resting on a calcareous subsoil, the upper stratum being composed of vegetable mould and disintegrated rock substances, chiefly limestone and trap. Even the cold clays which prevail in several localities in the central plain occur in intimate and abundant connection with their natural fertiliser the limestone. Wherever this basis exists, the injurious effects which might otherwise ensue from the excessive moisture of the climate are in a large measure counteracted. Both lime and phosphates, which are washed away in enormous quantities in wet weather, are in such areas restored from beneath in apparently inexhaustible quantity.¹ And even under the bogs plentiful supplies of marl, that excellent agent for the reclamation of poor soils, is known to exist in many places.

Notwithstanding this, a very large proportion of the surface, as it now exists, is waste and unproductive. In 1827 Mr. William Couling, giving evidence before a House of Commons Select Committee, estimated that Ireland possessed 2,416,660 acres of "unprofitable waste" and 4,900,000 acres of "uncultivated, but improvable" land. The census returns of 1841 gave a total of

¹ See *Journal Irish Dept. Agric. and Technical Instruction* (Sept. 1901), p. 45.

6,295,750 acres as "uncultivated ground," that is, including both bog and mountain. Sir Robert Kane three years later estimated that the bogs covered 2,830,000 acres, of which 1,254,000 acres were "mountain bog" and 1,576,000 were "flat bog;" and he adds, "that of the land at present waste 4,600 000 acres are really available for agriculture."¹ And in 1901 some 4,804,500 acres, or more than $23\frac{1}{2}$ per cent of the total area, were classified as unproductive, that is, as "turf bog (1,161,300 acres), marsh (410,800 acres), barren mountain land (2,226,100 acres), roads, and fences," part only of the water areas being also embraced in the total.

The *most fertile districts* are the Golden Vale in Tipperary and Limerick, the county of Meath, and parts of the counties of Dublin, Longford, and Kildare, the valley of the Lagan including parts of Armagh, Down, and Antrim, and the low-lying tracts beside the Lower Shannon, the Suir, Nore, Barrow, and Bann. In counties Louth, Wicklow, Wexford (in part), Waterford, Cork, and Kerry the soil, resting upon clay slate (Silurian) formations, is generally poor; though "Mounster," says Edmund Spenser, has "the sweetest soyle of Ireland." Luxuriant herbage springs readily all over the shallow loams of County Roscommon, part of Clare, in Limerick, Mayo, and Galway. In the remaining parts of Ireland there is also a high proportion of land of fairly average fertility, although some of it, being in the hands of the poorest class of cultivators, suffers from inefficient tillage and over-cropping. Arthur Young, describing the soil of counties Tipperary and Limerick said, "It is the richest soil I ever saw, and such as is applicable to every wish. It will fatten the largest bullock, and at the same time do equally well for sheep, for tillage, for turnips, for

¹ *Industrial Resources*, pp. 32 and 244.

wheat, for beans, and in a word for every crop and circumstance of profitable husbandry.”¹

The extraordinary fertility of certain favoured localities is shown by the maximum yields per acre of certain crops when compared with the average yields for the same for Great Britain generally, as in the next table, compiled from data given by Sir Robert Kane.² The

	Wheat.	Barley.	Oats.	Potatoes.
Average yield (Gt. Britain)	103 stones	126 stones	106 stones	6 tons
Maximum yield (Ireland)	300 stones	320 stones	288 stones	32 tons

wheat was grown in County Waterford; the barley in Kildare, Carlow, and Meath; the oats in Londonderry; and the potatoes in Meath.

The natural humidity of the climate, together with its mild and equable character, and the prevailing calcareous nature of the soil, tend to foster the growth of an especially sweet and nutritious pasture; and on the other hand the heavy rainfall, especially in the hilly districts, by causing wet seed-sowings and wet harvests, operates prejudicially upon the cultivation of cereals and similar crops. For these reasons, though not for these alone, for there are others of a social, or rather of a psychological character, Ireland has always been a pastoral rather than a strictly arable country. In all Ireland there is only one county, namely Down, in which there is anything approaching to an equality in the areas

¹ Quoted by Sir Robert Kane, *Industrial Resources*, p. 241. See also p. 459 of vol. i. and p. 6 of vol. ii. of Arthur Young's *Tour in Ireland*, ed. A. W. Hutton (London), 1846.

² *Op. cit.* pp. 242, 243.

devoted to the plough (47·3 per cent) and to pastoral grazing (52·7 per cent). In every other county the pastoral area is overwhelmingly the greater.

It will perhaps be expedient to state here, in the words of Sir Robert Kane, what the social or psychological causes for Ireland's preponderance of pastoral agriculture are, and then pass on. He says,¹ "Mere industry has been in Ireland for many generations connected with the idea of a vulgar and depressed caste. The possession of the land with perfect idleness constituted in itself the criterion of respectability. The working of a tillage farm, even if more profitable, was more fatal to the social position of the occupier, whilst if he kept only a herd to mind some cattle, and spent his time and money in hunting and in drinking, trusting to Protection for high prices, and to Providence to pay his debts, he mixed with the notables of the land and looked down with scorn ineffable on all that savoured of occupations vile, of industry, or intelligence."

Since the great famine in the middle of the nineteenth century the area of the land under pasturage has tended to increase at the expense of the area devoted to tillage. The change is, of course, to some extent attributable to the general economic tendencies of the age in all the older productive countries, namely the fall in agricultural prices and the decrease in the rural population, though in Ireland the decrease of population has been occasioned almost entirely by emigration, and only to a very small extent by the concentration of the rural population in the towns (unless the towns of Great Britain be included). But even when this has been duly allowed for, the shrinkage in arable land has been relatively greater in Ireland than for instance in England.

¹ *Industrial Resources*, pp. 286, 287.

In 1860 the area subject to the plough in Ireland, excluding the grazing crops of meadow and clover, amounted to 4,375,600 acres, but by 1901 had decreased to 2,452,500 acres; whereas the permanent grass, meadow, and clover increased from 11,078,150 acres in 1860 to 12,756,400 acres in 1901; or a decrease of 1,923,100 acres and an increase of 1,678,250 acres respectively. Thus of the entire cultivated area in 1901 62·7 per cent (53·2 per cent in 1860) was given over to grazing and the maintenance of live stock, and 16·2 per cent (21·2 per cent in 1860) was actually under the plough.

The balance of acreage (1,923,100 acres as compared with 1,678,250) appears to indicate that, within the period indicated, several thousand acres have reverted annually to the state of uncultivated waste; but this apparent extension of waste is in part accounted for by the more careful enumeration of the unproductive areas which has been made since 1877, and also by the personal divergences of opinion in the many enumerators as to what constitutes "barren mountain waste" on the one hand, and what poor mountain pasturage on the other. In point of fact, "it would seem that a very large amount of waste land has been reclaimed during the past sixty years."¹

In the shrinkage which has taken place in the arable land the crops which have suffered most have naturally been the cereals, especially wheat, though all have suffered severely. Where $10\frac{1}{3}$ acres of wheat were grown in 1855, only 1 acre was grown in 1901; the corresponding figures for oats being 2 acres and 1 acre respectively, and for barley $1\frac{1}{3}$ acre and 1 acre. But oats is still, as it was then, the crop which is most

¹ *Ireland, Industrial and Agricultural*, p. 179 note, supplemented by the agricultural returns for 1901.

extensively grown : of the total area under cereals in 1855 *oats* occupied 75·9 per cent, but in 1901 as much as 83·4 per cent. Probably no soil in the United Kingdom is so suitable for barley as that in certain districts of Wexford, Cork, and northern Tipperary.

Although the *potato* is not now cultivated to anything like the same extent as it was formerly, it is still the staple food of the majority of the poorer population in the south and west of Ireland. In 1862 over 1,000,000 acres were planted with this "root," and in 1849, only two years after the great famine, it occupied 718,000 acres; but in 1901 the area had diminished to 635,340 acres. Connaught is the largest grower of potatoes; then come Ulster and Cork, Tipperary, and Kerry.

The shrinkage which has taken place in the areas of the cereals and the potato extends also to *flax*. In 1855 this crop was grown on 97,075 acres; but in 1864, under the fortuitous stimulus of the American Civil War, and the consequent short supply of cotton, no less than 305,000 acres were planted with flax. By 1870 the area had contracted to little more than one-half of this figure, and in 1898 it reached its lowest level, namely, 34,470 acres; but by 1901 it had again increased to 55,470 acres. Whatever the industrial or commercial causes of the decline between 1864 and 1898, and they are matters of controversy, there is at least one purely agricultural cause which will to some extent account for it. That is the introduction of the drill-plough, which is not adapted for deep penetration of the soil, and coming unaccompanied by the subsoil plough, led to shallow cultivation; whereas flax, like the beetroot, thrives best on land which has been deeply ploughed and turned up rough. The new Department of Irish Agriculture took energetic steps in 1901 to find out and

remedy some of the more obvious defects of the flax industry. The cultivation of flax is almost entirely confined to Ulster; the only place where any quantity, and that relatively small, is grown outside that province is Ballina in County Mayo.

The cultivation of *turnips* decreased by some 77,100 acres between 1855 and 1901; on the other hand, the area planted with mangel wurzels more than trebled within the same period, having been 22,570 acres in 1855 and 77,262 in 1901. One-fourth of the latter crop is grown in County Cork.

There is, however, a counterpoise to these depressing features of purely arable tillage. It is the very satisfactory increase in the numbers of Ireland's *live stock*; but as regards the quality, although earnest efforts are being made towards improvement, there is still a good deal to be desired. The annexed table shows the remarkable increase which has taken place in the numbers of almost every class of animal since 1841:—

Year.	Horses and Mules.	Cattle.	Milch Cows and Heifers in Calf.	Sheep.	Pigs.	Asses.	Poultry.
1841	552,569	1,840,825	1,517,672 ¹	2,091,199	1,358,101	90,315	8,334,427
1901	593,552	4,672,035	1,481,443	4,378,645	1,219,043	244,994	18,807,766

But it will be more interesting, as affording a good test of the real advance which the Irish farmers have made in material wealth, to see how many head there were of each class of animal in proportion

¹ This return is for 1854, the first year in which these animals were enumerated separately. In 1859 the number of milch cows and heifers in calf was 1,690,389, a number which has never since been equalled. In the table these animals are also included in the "cattle" column.

to every 1000 inhabitants; again taking the same two years:—

Year.	Horses and Mules.	Cattle.	Sheep.	Pigs.	Poultry.
1841	67	225	256	166	1019
1901	133	1049	982	273	4104

Yet one more table, to show the relative wealth of poverty-stricken Ireland in respect of live stock as compared with certain other countries in which agriculture is the predominating industry:—

Country.	Horses per 1000 Inhabitants.	Cattle per 1000 Inhabitants.	Sheep per 1000 Inhabitants.	Pigs per 1000 Inhabitants.
Ireland (1898) .	138	996	951	278
England (1898) .	36	152	511	69
Jersey (1898) .	45	221	6	118
Denmark (1898)	187	726	448	491
Hungary (1895)	127	372	448	404
France (1898) .	80	348	552	162
Prussia (1897) .	89	335	249	298

Accompanying and consequent upon the change from tillage to pasture which has been going on since 1841, there has been a marked *decrease in the number of the smallest holdings* (1 to 15 acres), and a proportionate increase in the number of farms measuring 15 acres and upwards. Notwithstanding this, Ireland still remains a country of small peasant farmers, 68 per cent of the farms being less than 30 acres in extent, as compared with 93 per cent in 1841. The number of farms above

200 acres in 1900 amounted to less than 1·6 per cent of the whole. The holdings between 1 acre and 5 acres numbered 310,436, or 44·9 per cent of the whole number, in 1841; as compared with only 62,154, or 12 per cent, in 1900. Of holdings between 5 acres and 15 acres there were, in 1841, 252,799, or 36·6 per cent; as compared with 154,751, or 30 per cent, in 1900. In 1841 there were 79,342 holdings, or 11·5 per cent, between 15 acres and 30 acres, as compared with 133,530, or 26 per cent, in 1900.

CHAPTER XXXIV

THE IRISH LAND QUESTION—CAUSES OF IRELAND'S DECAY—POSSIBILITIES FOR THE FUTURE

1. Ancient Irish Land Tenure

THE causes of Ireland's backwardness and the probabilities of her regeneration cannot be discussed without reference to the past. Some of these causes have been in existence for many centuries; others have originated entirely within the last three hundred years; whilst yet others date back little more than fifty years.

Down to the reign of James I.—*i.e.* the year 1605, the ownership and occupancy of land were tribal rather than individual, as well as in part strongly tinged with what we should now call communistic ideas. From the Introduction to O'Curry's *Manners and Customs of the Ancient Irish*,¹ it appears that the whole of the land was the common property of the sept or tribe; part of it being vested in the chiefs or lords, part being retained as common grazing ground. A portion was also set apart as the appanage of the supreme chief, or king. The lords tilled and grazed only a section of the lands allotted to them; the rest they let out to tenants—some of them free tenants, some of them "base" tenants, some small co-operative bands of men who worked the

¹ Edited by W. K. Sullivan (London, 1873).

land and shared the produce together, but all enjoying a fixity of tenure guaranteed by the ancient laws (Brehon). There were also, it is significant to note, a class of tenants at will, who enjoyed the usufruct of a parcel of land for one season only. The succession to the lands and chattels of the "fixed" tenants was regulated by the laws of gavel-kind, whereby the sons inherited equally, and later on the daughters in case there was no son.

2. Alienations under Elizabeth and James I.

In Elizabeth's reign more than 570,000 acres which belonged to the Irish were forfeited (1580-84) through rebellion, and conferred in vast estates upon Englishmen, amongst them Sir Walter Raleigh, who received 12,000 acres, and the poet Spenser, who got about 3000 acres. At the same time in these appropriated districts the ancient Irish tenures of land were abolished, and the English system of landlord and tenant substituted in their place. In the next reign the Irish systems were abolished everywhere, together with inheritance by tanistry¹ and gavel-kind, the free tenants being either drafted on to the poor lands or converted into freeholders. Amongst the "evill uses" which Edmund Spenser enumerates as afflicting Ireland at this time he lays great stress upon the mischiefs incidental to tenancies-at-will—the form of tenure principally substituted for the ancient system. "There is one generall inconvenience which raigneth allmost throughout all Ireland: that is, of the Lordes of landes and Free-holders, whoe doe not there use to sett out theyr landes to farme, or for terme of yeares, to

¹ Tanistry regulated the succession of the chieftainship and his mensal lands.

theyr tenauntes, but only from yeare to yeare, and some during pleasure; neither indede will the Irish tenaunt or husbandman otherwise take his land then soe longe as he list himselfe. The reason herof in the tenaunte is, for that the land-lordes there use most shamefully to racke theyr tenauntes, laying upon him Coygnye and Liverye at pleasure, and exacting of him (besides his covenante) what he please. Soe that the poore husbandman either dare not binde himselfe to him for longer time, or that he thinketh by his continuall libertye of chaunge to keepe his land-lord the rather in awe for wronging him . . . also the tenaunte, being left at his libertye, is fitt for everye occasion of chaunge that shal be offred by time; and soe much also the more readye and willing is he to runne into the same, for that he hath noe such estate in any his holding, noe such building upon any farme, noe such costes employed in fencing and husbandring the same.”¹

3. Tenancy at Will

It is to these causes, especially the uncertainty attendant upon tenancy-at-will, that the poet attributes the Irishman's unsavoury habits of life. Their dwellings being “rather swynes-steades than howses is the cheifest cause of his soe beastly manner of life and savadge condicion, lying and living together with his beaste in one howse, in one roome, and in one bedd, that is the cleane strawe, or rather the fowle dougehill.”

The preference of the Irish tenant for the tenancy-at-will, in spite of its tyrannous and arbitrary exactions of free lodging and gratuitous provision for man and beast (“coygnye and liverye”) and its precarious uncer-

¹ *Present State of Ireland*, ed. cit. pp. 644, 645.

tainty, was clearly the direct result of the disturbed condition of the country: there had been two fierce rebellions, both crushed with merciless severity and even cruelty, within the space of twenty-six years. But even when this is duly allowed for, should not also some part of the preference be set down to the compatibility of the system with the excitable and mercurial temper of the Irish blood, and the tribal pride of the Irish mind? John Stuart Mill, it is true, scoffed at the idea; but John Stuart Mill was not without his prejudices, and in his day the lessons of comparative psychology were scarcely if at all known. And other inquirers, knowing Ireland better than Mill, do not agree with him.

At all events, it must not be forgotten that, "all the Irish allmost boast themselves to be gentellmen, noe less then the Welsh; for yf he can derive himselfe from the head of a septe, as most of them can (and they are experte by theyr Bardes), then he holdeth himselfe a gentellman, and therupon scorneth eftsones to woorke, or use any handye labour, which he sayeth is the life of a peasaunte or churle; but thencefoorth becometh either an horseboy, or a stokaghe to some kearne, enuring himselfe to his weapon and to his gentell trade of stealing (as they counte it)." ¹ This unsaintly spirit of pride, this disinclination to industry and aversion to settled habits of life, which it must be acknowledged are not even yet extinct in "the green isle of the saints," are traced by Sir John Davies, another English writer, to the custom of gavel-kind, which, he says, "did breede another mischiefe; for thereby, every man being borne to land, as well bastard as legitimate, they al held themselves to be gentlemen. And though their portions were never so small, and themselves never so poor (for gavel-kinde must

¹ Spenser, *op. cit.* p. 672.

needs in the end make a poore gentility), yet did they scorne to descend to husbandry or marchandise, or to learn any mechanicall art or science. And this is the true cause why there were never any corporate towns erected in the Irish countries. . . . Besides, these poor gentlemen were so affected to their small portions of land, that they rather chose to live at home by theft, extortion, and coshering than to seek any better fortunes abroad.”¹

4. Origin of the Ulster Tenant-right

The alienation of another half-million acres and more in the plantation of Ulster, after the Cromwellian subjugation, of course added largely to the sum of bitterness and hatred which the Irish fostered against their conquerors; but its economic effects in no wise differed from those which followed upon the plantation of Munster, except that the Scottish settlers, entering upon their new sphere of labour with earnestness and zeal, soon converted Ulster into the most prosperous province in Ireland. It is also significant to note, that in this province alone the customs of tenant-right grew up and took firm root, so that a tenant farming in that part of Ireland might safely count not only upon compensation for the unexhausted improvements in his farm which he had himself introduced, but might look to his successor for a substantial sum of money for the good-will of the farm. The origin of the latter form of tenant-right, which is peculiar to Ulster, seems almost necessarily to imply a precedent state of good tillage. Mr. Barry O'Brien² traces its beginnings to the years 1617-20,

¹ *Discoverie of the True Causes why Ireland was never entirely subdued by the English* (London, ed. 1747), p. 172.

² R. Barry O'Brien, *Parliamentary History of the Irish Land Question from 1829 to 1869* (London, 1880), last chapter but one.

when several of the new English settlers, finding the conditions of their "plantation" not fulfilled, would appear to have disposed of the leases of their farms to their Scottish neighbours and gone back to England. At all events this form of tenant-right was not known previous to the plantation, and in 1603 tenancies at will predominated in Ulster as in other parts of Ireland.

5. Sir W. Petty's Account of Ireland in the Seventeenth Century

Sir William Petty calculated that in 1641 about two-thirds of the fertile land in Ireland was in the possession of the Irish Catholics; whereas when he wrote in 1672, or twenty years after Cromwell's settlement, the proportions were very nearly reversed, the English Protestants holding then some 70 per cent of the best land of the country. At the same time four out of every five of the Irish people lived in "wretched, nasty cabbins, without chimney, window, or door-shut, even worse than those of the savage Americans, and wholly unfit for the making merchantable butter, cheese, or the manufactures of woollen, linnen, or leather."¹ Between fifty and sixty years later Ireland was essentially a grazing country; indeed there seems to have existed some danger of the island not producing sufficient cereals to supply even the very modest wants of its inhabitants, for in 1727 a law was passed to compel every occupier of 100 acres to till at least 5 acres, under a penalty of 40s. But for this great increase in the amount of pasture, there were very sufficient causes.

¹ *Political Anatomy of Ireland* (London, 1719), 2nd ed. pp. 114, 115.

6. English Restrictions on Irish Industries—The Penal Laws

In 1666 Parliament decreed that the importation of Irish cattle and horses into England should be prohibited; and in the same reign (Charles II.) enactments were passed shutting out from England Irish salt beef and Irish bacon, Irish butter and Irish cheese. The Irish farmer, thus prevented from selling his cattle and beef in his natural market, turned his attention to the breeding of sheep. Then he was forbidden to export his wool, and was not allowed to spin it or work it up into textiles, except for his own personal use. But all the same he still went on growing wool for many a year, and—smuggled it abroad. “The Irish glass trade was ruined by the 19th of George II. Irish cottons were crushed by an import duty of 25 per cent. At one time Ireland was making sails for the entire British navy. This trade was put an end to by imposing duties on sailcloth made of Irish hemp. Irish beer, malt, hats, gunpowder, coals, bar iron, ironware, and other products were likewise the subject of legislative restrictions.”¹ A partial relaxation of these iniquitous measures was at length extorted, but not before 1779, and they were not entirely repealed until five years after the union; when free trade in corn was also at last established between the elder sister England and her despised and ill-used Cinderella.

After the conquest of Ireland by the generals of William III. more than one million and a half acres were again forfeited, and subsequently conferred in great part upon unworthy favourites and nominees of the Anglo-Protestant party. About the same time severe blows of a far-reaching and incalculable character were struck at the development of Irish agriculture by the

¹ Froude, *The English in Ireland*, vol. i. p. 446.

enactment of the Penal Laws—the Penal Laws—which made it *inter alia* illegal for a Roman Catholic in Ireland to own freehold property, or to hold a lease for a longer period than 31 years or at less than two-thirds of a rack-rent, and in various other ways raised obstacles to the free cultivation of the soil by those who preferred to confess the Roman Catholic faith. These enactments were, it is true, evaded in divers ways; but in spite of that their effects upon the husbandry of Ireland were little short of disastrous, and those effects have endured to the present day. One consequence of the actual operation of the Penal Laws was that estates were generally let on long leases to Protestant tenants, who in turn sub-let to their impoverished Roman Catholic neighbours, and generally on conditions which deprived them of such security of tenure as the law did purpose to leave to them. Moreover for several years these unfortunate men, the Roman Catholic sub-tenants, were subjected to a revival of the laws of gavel-kind, whereby their leased lands were at their death compulsorily divided amongst their children. Of this enactment, which flattered the patriotic sense of the Irish, they made a too facile, but none the less suicidal, use. For the fascination of "land hunger" has always exercised a potent spell, as it still does to-day, upon the mind of the Irish peasant.

It is thus from the period of the Penal Laws—and they were in force for eighty or ninety years, not being repealed until 1771-82—that we must date the beginning of the system of cottier tenancy in Ireland, a system which has called forth the scathing denunciations of M'Culloch, Stuart Mill, Fawcett, and other writers on academic economics. The evils of the cottier system, as it shaped itself in Ireland, were fully unfolded before

Lord Devon's Commission, which was to inquire into the Irish Land System in 1848

7. Effects of the Introduction of the potato

But, although the historical confiscatory political enactments against the Roman Catholics charged with a very great deal of the responsibility of the deplorable condition into which Irish agriculture would be untrue, and unjust, to make these the entire burden.

As early as the middle of the seventeenth century, very little after, the potato, which was introduced into Ireland by Sir Walter Raleigh only in 1610, became a flesh diet (beef and bacon) as the national food of the Irish people; at any rate it was their staple food. Sir William Petty wrote in 1672. Now owing to its prolific yield and the ease with which it can be cultivated, is distinctly the food of the poor. The extraordinary swiftness with which its cultivation spread throughout Ireland demonstrates how well it was suited to the national character no less than to the economic requirements of the Irish people. The potato is essentially a precarious crop, especially in a country which, like Ireland, has a damp climate and heavy rainfall. Hence it is not surprising that the potato famine followed in its wake. In 1739 a frost penetrated the ground and destroyed the bulk of the crop, occasioning a pretty general famine, in which it is estimated that over 200,000 persons perished. Again, in the short period from 1831 to 1839, there were no less than six seasons in which the potato crop was a partial failure, with a consequent scarcity amounting in some districts to actual famine.

No wonder then that the Irish peasant, enjoying so little scope for the employment of his energies on the land,¹ and debarred as he was by Act of Parliament from disposing of his labour in manufacturing industry, in sheer desperation bid an extravagant, and even impossible, rent for the patch of ground on which to grow his few indispensable potatoes. The gaunt visage of starvation, staring him ever in the face, prevented him from considering either the capabilities of the soil or his own ability to pay. One of the witnesses before Lord Devon's Commission stated, that for a farm which he knew to be worth £50 a year, men bid and bid one against another until finally it was let at an annual rental of £450!²

Nor did the appalling precariousness of the Irish peasant's situation deter him from multiplying his kind at a rate even more appalling. The real owners of the soil were mostly absentees, and many of them neither knew nor cared about the desperate plight of the people it supported. The self-interest of the intermediate tenant, who lived on the estate and discharged, however negligently, or even culpably, the duties of landlord, was directly opposed to that of the down-trodden Catholic sub-tenant; nor was there any stimulus to his sense of justice in the shape of poor-rates, for there existed no poor-law in Ireland until the year 1838. But in 1826 the consciences or the pockets of the absentee landowners were so far touched, that they procured an enactment designed to check the evils and malpractices which arose

¹ See G. R. Porter, *The Progress of the Nation*, written before the great famine, pp. 306 and 451, 452 of the 3rd ed. (London, 1851). The argument in the latter passage is however robbed of most of its point through the omission to mention that the digging of the Ulster Canal was contemporaneous with Father Mathew's crusade, to which much of the thrift there described should very probably be ascribed.

² *Digest of Evidence*, p. 851.

out of the indefinite and irresponsible sub-letting, sub-division, and reassignment of land held by their tenantry. "Had it been passed fifty years sooner," says M'Culloch, with sad truth, "and been properly enforced, it would have prevented much of the bad husbandry, poverty, and misery which prevail in that unhappy country."¹

The high prices which ruled so long as England's great duel with Napoleon lasted, coupled with electioneering hopes, had tempted the landowners in 1793 to create a vast number of forty-shilling freeholds (which conferred the franchise); but their political expectations not being realised, they, in 1829, procured the abolition of the measure, and—especially after the passing of the Poor Law Act in 1838—the number of freeholds decreased as rapidly as they had increased a generation earlier.²

8. The Famine of 1845-47 and its Effects

And things were in pretty much this position when there fell upon unhappy Ireland probably the most terrible of her many calamities. In 1845, and again to an even greater extent in the following year, the potatoes were diseased. Ireland was at this time possibly the most densely-peopled country in Europe. In spite of all that England could do, both publicly and through the channels of private charity, the sufferings of the stricken people were piteous in the extreme, as even those will to some extent remember who have once seen John Leech's harrowing cartoons in *Punch*. The Government supplied daily doles to over three million people; but it

¹ Note xix. to Adam Smith's *Wealth of Nations* (Edinburgh, 1868), p. 570.

² In 1795 there were only 4768 forty-shilling freeholds. By 1808 they had increased to 157,159, and in 1828 numbered 191,732; yet two years later there were only 14,246 of them left.

was not enough. Hundreds of thousands of persons died; indeed certain localities, for instance Skibbereen¹ in County Cork, would appear to have been almost depopulated. In two districts in the neighbouring County Kerry the death-rate in 1847 went up to 120 and 200 per thousand respectively.

This portentous calamity, occurring simultaneously with the repeal of the Corn Laws, led to a wonderfully rapid decrease in the number of cottier holdings. Still no outlet was provided for the employment of Ireland's surplus population, nor were the evils abolished which necessarily grow out of tenancy-at-will, the form of tenure which had been generally revived again on the abolition of the forty-shillings franchise in 1829.² The same events are also responsible for the steady conversion of arable land into pasture which has been going on ever since (see p. 596 above), as well as in part for the uninterrupted diminution of the population, though the last result is to some extent attributable to the former, for obviously pastoral pursuits cannot support so large a population per acre as tillage.

The system of landlord and tenant, which, as was pointed out above, was not unknown even under the Brehon laws, was, however, not the only mode of tenure prevalent in Ireland. There existed also the system of conacre, by which a plot of ground was let to a man for a season in return for so much labour, calculated, on a low wages basis, in terms of money valuation.

There also existed anciently, and has survived to

¹ Compare W. P. O'Brien, *The Great Famine in Ireland* (1896), pp. 78-81.

² Kohl says (p. 11), "It is unfortunately but too certain that in consequence of the O'Connell agitation, the tenant-at-will tenure is very much on the increase." Kohl's visit to Ireland took place, it should be recollected, just at the time when O'Connell was at the height of his power.

quite recent times, a system of tenure known as the rundale, or runrig, the germ of which is seen in the co-operative farming of the ancient Irish. This system of co-partnery, which in several particulars seems to have resembled the open-field system that anciently obtained in England and elsewhere (*e.g.* Denmark and Germany), and which is described on pp. 287-290, was found, for example, by Lord George Hill prevailing at Gweedore in Donegal, when he bought that estate in 1838. Its effects as regards tillage were neither fewer nor less baleful than the tenure by tenancy-at-will.

But there was an even more vicious mode of peculiarly Irish tenure, which likewise shows relationship with the rundale system, and which existed down to the year 1894 in the island of Clare, off the west coast of County Mayo, where the possession of a patch of arable ground, no matter how small, conferred upon the holder or tenant the right of unlimited grazing on the common pasturage of the island.¹ This system, it is at once patent, put a direct premium upon the minute subdivision of the land, to say nothing of the hindrances which it nourished against progressive—nay against even good tillage.

9. Irish Character and Industrial Habits

For the fact cannot be denied, and it would be venal to attempt to gloss it over, or distort it, that, even at the present day, the Irish peasant is, in far too many cases, addicted to extremely primitive and improvident methods of tillage, as well as complacently content with a deplorably unsatisfactory standard of living. A very large sum, represented in terms of the national capital, is

¹ See *Tenth Report of the Congested Districts Board for Ireland* (Dublin, 1901), pp. 21-28.

wasted or lost entirely in Ireland every year owing to sheer indolence and lack of energy, carelessness and improvidence, extravagant waste that is almost criminal, and ignorance of even some of the most elementary truths of agriculture. Notwithstanding the excellent progress which has been made since 1889, the Irish small farmer is still too often slovenly both in his work and in his appointments, has a rooted and slavish veneration for custom and tradition, and is possessed of an inert apathy with regard to improvement which frequently amounts to stubborn hostility. He cultivates very few crops—potatoes, oats, and occasionally barley constitute his sole variation. He never fallows. Of rotation of crops he knows nothing; to him the use and value of artificial manure are a mystery. And it goes without saying that he is insensitive to the mutual advantages of mixed arable and live-stock farming. Nay, even when his own personal profit is directly pointed out to him, and assistance offered him to realise it, he is sometimes too indolent or too apathetic or too ignorantly obstinate to take advantage of it.¹ As for the strenuous and unremitting toil in which his compeers in France, Würtemberg, and other European countries excel,—to the Irish peasant all that is a sealed book. Mr. Mitchell Henry, a philanthropic Englishman who has spent his life in reclaiming land and people in the wilds of Connamara, says, "The Irish peasant hates agriculture—meaning the cultivation of the soil—and is utterly ignorant of all its principles. He detests to dig, and has not the patience to see things grow, as he himself ex-

¹ In *Industrial Ireland* (London, 1887), Mr. Dennis cites (p. 20) the case of a man who, although he could not make £2 a ton of his hay at home, yet refused to take the trouble of trussing it and putting it on the railway for Dublin, where he knew for certain he could sell it for £4 the ton.

one, and delights in cattle-jobbing, and in taking the turn of the market. He wants expensive grazing farms to raise his stock, and his greatest pleasure is to drive them from market to market, and partake of the pleasures of the outing, and the indulgence in hilarity, to use a mild term, which attends all these gatherings.”¹ Many other disinterested observers have said the same thing. Bishop Berkeley, wise, shrewd, broad-minded, warm and generous in his sympathies, wrote thus in 1749: “There still remains in the natives of this island a remarkable antipathy to labour . . . an innate hereditary sloth. . . . Their fields and gardens are a lively counterpart of Solomon’s description in the Proverbs (xxiv. 30, 31). . . . In every road the ragged ensigns of poverty are displayed; you often meet caravans of poor, whole families in a drove, without clothes to cover, or bread to feed them, both which might be easily procured by moderate labour.”² But he cautiously adds, that this description does not apply to “persons of rank and education,” nor yet to “all even of the lowest sort, though it may well extend to the generality of those, especially in the western and southern parts of the kingdom, where the British manners have less prevailed.” In another place he asks, “Whether the bulk of our Irish natives are not kept from thriving by that cynical content in dirt and beggary which they possess to a degree beyond any other people in Christendom?”³ Similar testimony might be quoted in abundance from Spenser to John Bright. Yet to what end multiply evidence quantitatively? The keen-eyed,

¹ Quoted by the Right Hon. H. Plunkett, in *Help for Self-help in Ireland* (Dublin, 1898), pp. 11, 12.

² *A Word to the Wise* (*Works*, vol. iii. p. 438, Oxford, 1871).

³ *The Querist*, No. 19 (*Works*, vol. iii. p. 356).

keen-minded bishop—there is no denying the fact—put his finger on the crucial point, from which it depends whether or not Ireland's regeneration shall in the fulness of time be duly accomplished. Until that shall be accomplished, remedial legislation is little better than whitening over the cracked walls of the decaying cabin.

Is the Irish peasant doomed, then, to inhabit "the field of the slothful" all his days, to "display in every road the ragged ensigns of poverty" to the end of time? Sober reason answers—Not necessarily; reasonable hope echoes—Surely not. For beyond question the industrial habit was once possessed by, at any rate, certain sections of the Irish people. The now extinct industries—the industries which flourished before the repressive enactments of William III.'s reign—manifestly presuppose it. The aptitude and manual dexterity of the Irish people are unquestioned. They showed themselves centuries ago in the illuminated manuscripts, the lace, the wood-carving, the metal-work, the leather-work, the lapidary's, the goldsmith's, the jeweller's craft long before the English ever set foot in Ireland. And the same taste, the same quickness, the same skill are exhibited at the present day in lace-making, woollen weaving, and similar domestic industries.

This only applies of course to the handicrafts and the manufacturing industries; but the important question is—Can the industrial habit be awakened in those who are dependent upon the land, which must still be Ireland's chiefest industry in the future, as it has been her chiefest industry in the past? What do the facts say? To begin with, there are some 20,000 Irish agricultural labourers who go over to England year after year for the summer months, and visit the same farms, and there work steadily

and soberly, save money out of their wages, and carry their hard-won savings home to their families in Ireland. This, it is to be noted, is done by men who are ignorant, who have none of the advantages of education to help them. What will they do then, what may they not be expected to do, in the long last day when they shall feel the uplifting power which education is capable of bestowing? But let us look farther back. When O'Keefe's country, on the confines of counties Limerick, Cork, and Kerry—a notorious asylum for whiteboys, smugglers, robbers, and outlaws—was opened up in 1822-29 by the construction of roads through the mountains, the men who made them saved their wages and laid by the money in "building substantial houses, and in the purchase of stock and agricultural implements, and numerous examples might be shown of poor labourers possessing neither money, houses, nor land when first employed, who in the past year have been enabled to take farms, build houses, and stock their lands."¹ And a similar happy result ensued from the building of the Ulster Canal twenty years later, as has been already implied.

The great things that can be accomplished in the way of improvement in Ireland, when only the effort is directed with intelligence and energy, and supported by earnestness and goodwill, equally without as with material means, could be illustrated by a multitude of instances. The classic example of the prosperity which attends the residence of a kindly, enlightened, and active race of landlords amongst their tenantry is that of the Edgeworths of Edgeworthstown, to which J. G. Lockhart has borne witness in chap. lxiii. (year 1825) of his *Life of Scott*. The village of Bessbrook in County Armagh, but close to Newry, where

¹ Quoted in G. R. Porter, *Progress of the Nation* (London, 1851), p. 294.

a Quaker, Mr. J. G. Richardson, founded linen-spinning mills, is described as being at the present time a pretty and thriving town, with exceptionally neat cottages, but with neither police barracks nor pawnshop, and a freedom from the evils which spring from the love of strong drink. Lord George Hill effected a remarkable improvement both in the agricultural economy and in the manner of life of the people at Gweedore; and so did Mr. Mitchell Henry at Kylemore in Connemara; and an equally remarkable amelioration has been accomplished at Clifden in County Galway by the D'Arcy family since 1822.

These few instances will suffice to show that the Irish are not incapable of being converted to habits of industry and perseverance even in the domain of agriculture as well as the handicrafts, and that they can be inspired with sufficient self-respect to preserve the higher standard of life which they have once been helped to obtain. Nor does the fact that the lowest dregs of the population in the great cities of England, Scotland, and America (London, Manchester, Glasgow, New York, Chicago) consist to a large extent of Irish in any way invalidate this conclusion. These abandoned strata of civic society are uniformly ignorant, perpetually surrounded by strong temptations, and they do not enjoy the advantage of having an ennobling, or even an encouraging, example constantly before their eyes. It is well attested, that the second, or at any rate the third, generation from the Irish immigrant, even in the great cities of America, regularly settles down into as good a citizen as the average American, quite as orderly and law-abiding, quite as industrious, quite as self-respecting. An eloquent tribute that to the Irish character, once it gets away from the contaminating virus

of historical prejudice and the unwholesome atmosphere of self-interested agitation! Nor should the testimonial which Lord Milner gave to the progressive spirit of the Irish of Johannesburg in March 1902 be altogether overlooked.

But probably the most powerful instrument for persuading the Irish peasant to tread the difficult path of self-improvement exists within his own bosom. For several centuries this force has, for the most part, been perverted to unworthy, though excusable, ends. We allude to the power of sentiment, and more particularly the love for country which undoubtedly does burn strongly in every true Irish heart. "Without the aid of sentiment," says Mr. Plunkett,¹ "you can do no practical good in Ireland. Furthermore it is a strange fact, that the lower you descend in the social scale the more potent is the appeal to the better feelings of the people. In prosperous districts our organisers [of the Irish Agricultural Organisation Society] find that the higher ideals of material advancement arouse comparatively little enthusiasm. But among the very poorest of the poor we find that the idea of the welfare of Ireland inspires them more than any other thought with the desire to help themselves and each other."

Nor is the clan or sept feeling, which is but another manifestation of patriotism, yet wholly dead amongst the Irish people. "Isolated," to quote Mr. Plunkett again, and no man living has a better right to speak on this subject than he—"Isolated, the Irish farmer is conservative, sceptical of innovation, a believer in routine and tradition; in union with his fellows, he is progressive, open to ideas, and wonderfully keen at grasping the essential features of any new proposal for his advance-

¹ *Help for Self-help in Ireland*, p. 10.

ment.”¹ The wonderful power which lies in this sense of united and sympathetic effort, especially when borne along by a kindling wave of enthusiasm, is exemplified in many passages of Irish history. The missionary enthusiasm of the monastic schools in the early days of Irish Christianity is probably attributable, in part at least, to this cause; as are also to a great extent the success of the stirring political agitations sustained by Grattan and Flood, O’Connell, Parnell, and others. But the most astonishing illustration of the power of this latent force in the Irish character is assuredly the success—the almost miraculous success—which attended Father Mathew’s temperance crusade in the years immediately following 1838. This simple but earnest man claimed to have administered the pledge of abstinence to not less than five millions of his countrymen, or about two-thirds of the entire population. But the really significant fact about this remarkable man’s crusade is not so much the measure of its numerical success, as the fact of its permanence, and that in a race peculiarly mercurial, sociable, and untrained in habits of self-denial. Many independent witnesses speak to the sincerity and enduring steadfastness of the majority of those who became converts to Father Mathew’s zeal, amongst them the German traveller already mentioned.² And even quite recently a writer in the *Daily Telegraph* (11th October 1901) has not only confirmed this: “For several years the great mass of Father Mathew’s innumerable converts kept their pledge of scrupulous sobriety;” but he adds, “It is a touching but well-authenticated circumstance, that there are men alive, even now, on both sides of the

¹ From an address delivered at the Crystal Palace on 16th August 1901, being the Presidential Address of the National Co-operative Festival.

² Kohl, *Ireland*, pp. 36, 51-62, 70, 89.

their teens, and have kept it into the beginning of the twentieth century."

Is there no regeneration then for a people? Is the race who manifested such enthusiasm, such renunciation, such steadfastness utterly and hopelessly incapable of economic regeneration? As common sense refuses to credit such a conclusion, reason adds, that it were folly to assert categorically that anything is impossible to men who suffered so much to be thus influenced by a Father Mathew, whose eloquence was not his, nor a magnetic personality, but nothing but a simple, saintly humility and earnestness of conviction.

The spirit of turbulence and lawlessness which flamed out in the Irish people at so many crises in their history ought not to be imputed to them as an inherent sin. The circumstances have in too many instances been so provocative, and so far share in the moral responsibility which they have drawn in their train. For example, the open evasion which was permitted of the tax on wool in William III.'s reign and later, and the smuggling abroad of wool, which went on for many years, both tended to breed up a disrespect for the law and a too great readiness to set it violently at defiance. Another contributory cause was the inaccessible nature of many parts of the country owing to the absence of roads. The bogs, and before their final destruction, which served for generations—indeed the observation of the bogs as we have already incidentally shown, as late as 1829—as retreats for evil-doers and all kinds of lawless characters. But the "want of order, of obedience to the laws" which Porter complained of, and which he regarded as, in a great measure, the retributive

quence of the arrogance, extortion, and utter indifference of the absentee landlords, more especially from the beginning of the eighteenth century. This is the stigma history puts upon them, a stigma which can never be washed out, though it may indeed be atoned for. No more scathing proof of the incalculable wrong which has been done to Ireland by this social abuse was probably ever penned than the picture which Kohl draws¹ of the prosperous and happy condition of the tenantry on the Edgeworth and Tuite estates, the landlords of which were not absentees.

10. Irish Emigration

Forty or fifty years ago John Stuart Mill stated it as his conviction, that of the Irish question there were only two solutions possible: "England, it is probable, has only the choice between the depopulation of Ireland and the conversion of a part of the labouring population into peasant proprietors."² Since these words were penned a good deal has been done towards the realisation of both these alternatives; or rather, the first having been for many years going on apace, latterly attempts have been made to stop the process by helping on the second alternative. As is well known, Ireland has been for the most part depleted of her population through their emigration to the United States and elsewhere. Between 1841 and 1851 it is estimated that 1,240,750 persons emigrated from Ireland; adding to these the number who emigrated between 1851 and the end of 1901, it results that since about the date of the great famine Ireland has lost 5,163,212 of her sons and daughters through this cause alone. Since 1890 there has been a

¹ *Ireland*, pp. 8, 9.

² *Principles of Political Economy*, Book II. chap. x. § 2.

falling off in the annual number of emigrants to an extent of 50 per cent; but in spite of this 50,000 persons still leave the shores of Ireland each year.

11. The Land Acts of 1870-91—The Commission of the Districts Board

On the other hand, since 1870 the Irish legislation, as embodied in a succession of Land Acts, has deliberately been directed towards the conversion of Irish tenants into peasant proprietors; the earliest of these Acts, that of 1870, was the first definite enactment to that end, passed by John Bright.

The more immediate objects of the various Land Acts have been to secure to the tenant a fair rent, a secure tenure, and freedom to dispose of the ground he occupies on an unexpired lease—"the three F's"—which the Acts sought to obtain by granting him an equivalent for his Ulster tenant-right and a claim for unexpired improvements made by himself; and in the process not only to give him facilities for purchasing the land at a fair value, but to lend him the money to effect the purchase. Indeed, it may fairly be questioned whether in some respects the balance has not tipped to the opposite side,¹ and whether it has not been done to the landowners by these Land Acts. Nay, it may fairly be questioned whether the Acts are for the best interests of the tenant, and for

¹ We need not, however, go anything like so far as J. Morris does (*Present Irish Questions*, London, 1901); for we must not forget the universal decline in agricultural prices which occurred during the last quarter of the nineteenth century, nor the position which Ireland possesses in her relative wealth of live

welfare of the Irish character, that the tenant should be empowered to purchase without first staking some of the fruits of his own industry.¹ The power of self-help ought to be the precedent condition of help from governmental sources. There is yet another *caveat* to be borne in mind. There are of course obvious limits of a geographical and agricultural nature to the general applicability of a system of peasant proprietorship to Ireland. And yet, on the other hand, the success which attends co-operative grazing in County Roscommon, and the cases of Denmark, and Switzerland, and Jersey, all show that the conception of a peasant proprietor is not coincident with a spade-labourer only, but may embrace a community in which pastoral pursuits predominate.²

The Land Purchase Act of 1891 created a special Board—the Congested Districts Board for Ireland—whose particular business it should be to improve the conditions of living in the poorest districts of the west. This Board has laboured in every county of Connaught, as well as in parts of Donegal, Kerry, and Cork, and has already accomplished good work in increasing the size of the very small holdings (generally 2 to 4 acres), and in assisting the people in over-crowded localities to move into other districts which do not suffer in that way; further, it has striven to improve the quality of the live stock and poultry, to give the people information and advice as to the best methods of tillage, as well as show them these by example and experiment, to teach them the rotation of crops, the value of manures, greater variety of cropping, drainage, and so forth. It also tests for them the purity of various seeds, finds out remedies

¹ Compare the cautious doubt expressed by Mr. Lecky in *Democracy and Liberty*, vol. ii. p. 487, etc.

² Compare also what is said about Wexford above (p. 581).

for the prevention of diseases both in growing crops and in live stock, encourages the planting of fruit and forest trees, promotes bee-keeping, and makes roads and fences on the neglected estates it buys. In the space of ten years the Board has purchased for enlargement, has improved, and re-allocated to tenants, some thirty estates and farms, aggregating together 140,462 acres. And yet the methods by which this body works are both cumbrous and slow, and the results only partial.

12. The Co-operative Movement

Simultaneously with the formation of the Congested Districts Board, a small band of earnest, enlightened, and patriotic men set themselves to ameliorate the lot of their poorer countrymen by teaching them the principles, methods, and advantages of co-operation as applicable to farming and the allied industries. Out of their efforts grew in 1894 the Irish Agricultural Organisation Society, the moving spirit of which has been the Right Hon. Horace Plunkett. As the result of this Society's labours, Irish farmers have learned to manufacture butter on the Danish system, and in March 1902 there were 625 societies, with a membership of 57,000, working under its auspices. These included 224 dairy societies,¹ 114 agricultural societies, whose chief business it is to buy sound seed and honest manures on the principle of joint purchase, as well as implements and other farming requisites; 79 other societies, which carry on various rural industries from the scutching of flax to the making of lace; and 129 agricultural credit

¹ Out of forty awards made for fresh butter at the Islington October Dairy Show in 1901, Irish butter gained 39, and of these again 36 fell to co-operative creameries organised by this Society.

banks, organised on the Raiffeisen method, whereby temporary fixed loans can be obtained by each individual member on the joint credit of all the members. And the people have really responded to the stimulus given to them; they have indeed awakened to a sense of the value and necessity of self-help; and there is now manifest amongst them a growing spirit of self-reliance and an alert and intelligent interest in all that is being done for the economic and social regeneration of Ireland.

The advance of Irish agriculture has been still further promoted by the creation, in 1899, of an Administrative Department of Agriculture and Technical Instruction for Ireland. This body, like the two bodies already mentioned, aims to help the people to help themselves, and it seeks to secure its object by sending out lecturers on agricultural subjects, by conducting experiments in seeds and soils, manures and machinery, by holding agricultural shows and offering prizes, by disseminating information about continental and other methods of conducting agricultural operations, by subsidising local efforts with grants of money, and generally by giving instruction and advice in various ways calculated to promote the improvement of agriculture and the interests of farmers in general.

13. Present Needs and Prospects

Assuming the possibility of Ireland's recovery—and there can hardly be a doubt that she can recover herself if only her people *can* successfully shake off their "innate hereditary sloth," and *will* resolve not to throw up the sponge when difficulties come, but rather to fight against them until they overcome them—assuming the possibility of Ireland's recovery, there can exist no reasonable doubt

that the regeneration must come from some such methods as those which these several progressive and patriotic bodies of men are now putting into practice.

Sloth, ignorance, and poverty—these are the chief obstacles in the way of Ireland's awakening. The first has been already dealt with, and although it still remains a tremendous festering sore, it is not necessarily incurable, as this discussion will possibly already have shown; the third will, to a great extent, cure itself, once the first two are remedied. The second as well as the first drawback are now both in a fair way to being changed, at any rate partially, for the better. Three hundred years ago Spenser waxed eloquent in prescribing education as the best antidote to the barbarous manners of the Irish; and only sixty years ago Sir Robert Kane penned these, for the time, remarkable words: "The fault is not in the country, but in ourselves; the absence of successful enterprise is owing to the fact that we do not know how to succeed. We do not want activity, we are not deficient in mental power, but *we want special industrial knowledge*."¹

Elementary education, that is, in the ordinary sense, is not universally compulsory in Ireland, and the average attendance at the schools which do exist is far from satisfactory, only about 63 per cent of the children who are enrolled attending with anything like regularity. This state of things admits of course of being easily remedied. At the same time the lessons which may be learnt from Belgium and Holland, as related by Mr. Mulhall in Appendixes F and G of the *Report of the Recess Committee* (pp. 238, 239 and 258-261), would seem to possess peculiar value for Ireland. Indeed, as far back as 1843, the Devon Commission recommended

¹ *Industrial Resources of Ireland*, p. 393.

that elementary instruction should be given to the people in the principal branches of agriculture. This would, in view of the peculiar needs of Ireland, be a more serviceable, as well as more equitable form, in which to insist upon compulsory general education: teach the hands to use tools rather than the staggering minds to wrestle with books. The Government aid which would then be rendered would be redeemed from the implied stigma which is believed to attach to Government interference in England, for it would in reality be spent upon education. The people in England get free book education; why should not the people of Ireland get free handicraft and practical education? Anyhow, Ireland needs Government help of some kind, and Government help of some kind she must have, if she is to free her feet from the quagmire of poverty into which she has sunk. What can be accomplished with such aid, even with very unpromising materials, may be learned, with every encouragement for Ireland, from the case of Denmark, of Würtemberg, and of Egypt; and much encouragement might be drawn, further, from a study of the economic history and condition of the peasantry in the west, as compared with those in the east (Russianised part), of Finland. But these matters, tempting though they are, cannot be entered into here.

State assistance—regarded by certain English political leaders as in some sort the payment of a debt justly owing to Ireland—of the kind above indicated, is indeed being freely given to the Irish people, and if not in fully adequate measure, at all events to an extent which no longer leaves room for very serious complaint. And the helpful hand of the State extends also to the fostering of the fisheries and the building of railways. Since 1889 several of the remoter districts of the west have

been opened up by the construction of light railways connecting with the older systems, *e.g.* from Clifden to Galway, from Glenties to Stranorlar, from Dingle to Tralee. The effect of this policy is seen in the remarkable increase of the traffic receipts for all the Irish railways. Between 1887 and 1897 these receipts increased at a faster rate per mileage than did the receipts of the English lines.

Communication would be still further improved if the older railway systems could be radically reformed. In 1899, although the total length of the railway lines open to traffic did not exceed 3176 miles, of which no less than 2555 miles were single lines, they were divided amongst eighteen principal companies and thirty-one minor companies, whose property was either leased to or worked by the former, giving an average of only 65 miles of line per company. Agriculture in particular has had to suffer from heavy freight rates and the absence of through communication; and the fishing industry has also suffered most severely from the same causes, as well as from the lack of special storage waggons and similar adjuncts of a highly-organised and progressive railway management. Of the older railways no less than 70 per cent traverse the eastern half of the island; but as the long-neglected western half awakens to life it too must be provided with quick and cheap communication. In the more inaccessible parts of Connemara pack-horses are still employed for the conveyance of produce to and from market. Down to 1823 the only means of carrying goods between the upper valley of the Blackwater and the upper valley of the Lee in western Cork was on the backs of horses or on the shoulders of men and women.

There is yet one other direction in which Government

aid could very profitably be expended, and indeed, considering the magnitude of the undertaking, it is only Government help which can avail to any real extent. The west of Ireland ought to be systematically planted with forest-trees, not only as a shelter against the Atlantic gales and to supply the inhabitants eventually with fuel and building materials, but also for climatic reasons. But more useful than even this would be the drainage and reclamation of the bogs. Professor Tyndall estimated that, if the great central plain were to be thoroughly drained, the mean temperature of the island would be raised four degrees. Something has, it is true, already been done in this direction. Under the Drainage Acts of 1842 and 1863 some 345,200 acres were drained at a total cost of £2,331,000, and this land has since yielded an estimated additional annual revenue of £98,725, or an equivalent of nearly $4\frac{1}{4}$ per cent upon the outlay. But in view of the fact that there still remain close upon five million acres which are classed as unproductive, but of which a large portion would seem to admit of at any rate partial reclamation and subjection to husbandry, it is evident that there is here plenty of scope for governmental action.

And yet why wait altogether for the intervention of the Government? The peasants of Belgium in the Campine and along the sand-dunes near Nieupoort have reclaimed the almost barren sands inch by inch by spade labour, and by dint of much toil and addition of fertilising agents have rendered them productive. Moreover, something might be accomplished, and accomplished on even a large scale, by private capital were the excellent methods of the Rimpau system,¹ which has proved

¹ See *British Diplomatic and Consular Reports*, annual series, No. 452, *Agriculture in Germany* (1898), pp. 35-49 and 57; or more fully in

so successful in the Prussian province of Saxony and in Upper Bavaria, or those so conspicuously realised in the *veen* (fen) colonies of the Dutch province of Groningen, or the Prussian (Bourtanger) *moor* colonies (since 1890) in the adjacent province of Hanover, adapted to the conditions of the Irish bogs and moors.

Rimpau, *Die Bewirthschaftung des Rittergutes Cunrau* (Berlin, 1887), and
Fleischer, *Die Besiedelung der nordwestdeutschen Hochmoore* (Berlin, 1894).

CHAPTER XXXV

IRELAND—PEOPLE AND TOWNS

1. The People

THE aboriginal inhabitants of Ireland were in all probability closely akin to, if not identical with, the Iberian race which in prehistoric times occupied the westernmost regions of Europe. In the Early Bronze Age Ireland would appear to have been invaded, probably from the south, by a Celtic tribe or tribes, the first of several successive invasions by peoples belonging to the same stock. The attempt to disentangle and separate solid history from later imaginative accretions in the legendary chronicles of early Ireland has hitherto baffled the keenest scholars, and may here well be left alone. At the dawn of the Christian era, or a little before that epoch, Ireland would seem to have been inhabited by tribes who belonged to the Goidelic branch of the Celtic race, and to whom the name of Scots has been given. These people established themselves in Munster, in Ulster, and most strongly of all in the plain between the Wicklow Mountains and Carlingford Lough, that is the broad gateway through which they appear to have entered the island; and there they founded the kingdom of Meath, the special appanage of the Ard Righ or supreme king amongst the petty kings who parcelled

Ireland out between them. It should, however, be said that in Munster a dynasty was established which ruled for a thousand years, and frequently posed as the rival, rather than the tributary, of the over-king. The ruler of the kingdom of Munster held his court at Cashel, as the over-king of Ireland held his at Tara.

The ease with which Ireland could be entered on the east by forces coming from over-sea, and the great fertility of the valley of the Boyne and the regions adjacent between that river and the sea, are the natural causes why this part of Ireland is so exceptionally rich in prehistoric and archaeological remains.

In the third century the Scots of Ireland invaded the southern and south-western parts of Scotland, and thus eventually gave their name to that country. St. Patrick, with whom the authentic history of Ireland really begins, landed in Ireland in the year 432, or at the time when the Romans were "scuttling" out of Britain. St. Patrick had been trained in the Christian faith at Lerins in France, where the influence of the Egyptian anchoretic form of Christianity was held in high favour. Hence the prevalence of the hermit life which marked the early days of Irish Christianity; and the opportunities of obtaining a fish diet presumably led to the settlement of the Irish anchorites on the lonely islands and headlands of the west coast and beside the inland streams. But the early Irish Church was not only monastic, it was also tribal. St. Patrick astutely grafted his religious organisation upon the semi-communistic system of society which he found existing in the island. Thus the religious communities were rather families or septs, and their head, who might be a bishop, but was more often an abbot with bishops under him, was but the septal chief invested with ecclesiastical rank, or a tribal abbot

(or bishop); the King of Munster, for example, was also Bishop of Cashel. This tribal arrangement explains why there was no municipal or prelatic organisation in the Irish Church, and, taken in conjunction with the distracted political history of the island, explains also in part the late origin of municipal institutions except in the seaport towns. The Druids (or priests), the bards, and the brehons (expounders of the law) were powerful associations amongst the heathen Irish, and initiation into their orders was only obtained by a twelve years' study in the schools which they severally maintained. Out of this institution grew the monastic schools of Ireland¹ which became so famous in the fifth, sixth, and seventh centuries, and which, strengthened by refugee scholars from England, like Gildas, sent forth bands of zealous missionaries, such as St. Columbkille, who Christianised the Picts of Scotland; St. Columban, Gall, and Killian, who laboured in Germany, Switzerland, and Italy; and Cormac, who founded a religious colony in far-away Iceland. To the same circle belongs St. Brendan, whom legend makes to have discovered land far out in the wild, weird Atlantic.

The break-down of the central kingship was indirectly due to the clashing of authority between the secular and religious tribal chiefs. The over-king, Diarmid, took out of sanctuary a chief who had slain one of his messengers; thereupon St. Ruadan, with whom the man-slayer had taken refuge, went to Tara and solemnly cursed the holy hill, the centre and outward token of royal authority; and after Diarmid's death in 558, no assembly of all the people was ever after held at Tara. At this time Ireland consisted of a number of loosely cohering tribes, ruled by petty kings and chiefs, amongst whom, after the fatal

¹ See the very full accounts in Dr. John Healy's *Insula Sanctorum et Doctorum* (written in English), Dublin, 1890.

blow which St. Ruadan struck at the over-kingship, three appear to have stood out pre-eminent in power above the rest, namely the king of Munster in the south, and in the north the kings of the Hui-Neill, in Meath and in Derry. But the strong internal bonds of the tribal relationship, coupled with the looseness of the inter-tribal cohesion, seem to have been the chief obstacles to the concentration of power in the hands of any one amongst these three kings, especially after the national sentiment lost its strongest support in the dishallowing and abandonment of Tara.

The keys to the mastery of Ireland have always been her seaport towns. It was through Dublin that the later Goidelic invasion took place. It was through Dublin, Waterford, and Limerick that the Northmen or Vikings found entry into the island in the end of the eighth century. It was through Waterford that the English conquerors, the men of Strongbow and Henry II., gained their first footing in Ireland in the twelfth century. In the three towns where they first landed, the Easterlings, as the Northern Vikings, equally whether Norsemen or Danes, finally established themselves, and for nearly four hundred years monopolised the traffic and trade of Ireland, much as the Hanse merchants afterwards monopolised the trade of Norway from Bergen. For the Vikings were always traders as well as fighters. At first the English Pale, that is the portion of Ireland held by the English, was confined to the four counties of Louth, Meath, Dublin, and Kildare; and at no time did it exceed a fourth or a third of the country until after the confiscation and plantation of Munster in Elizabeth's reign.

The population of Ireland grew but slowly until towards the end of the eighteenth century. Sir William

Petty put it at 1,100,000 in the year 1672; by 1731 it had grown to 2,010,221; and this had about doubled again by 1791. From the beginning of the Napoleonic wars to the year of the great famine is the period in which the Irish multiplied fastest; *e.g.* in 1801 they are estimated to have numbered 5,216,329, and in 1841, when Ireland was relatively to area the most densely peopled country in Europe, they counted 8,175,124. Since then they have diminished with each successive census, until in 1901 they numbered only 4,456,546. As will be seen, however, from the table on p. 366, the diminution in different intercensal periods has by no means been at a uniform, but on the whole at a diminishing, rate. This decline, it must be remembered, is wholly due to emigration, or including under that term migration to Great Britain. The excess of births over deaths in Ireland in the last ten years of the nineteenth century would have added, if uncounteracted, upwards of 200,000 to the population.

2. Ancient Churches and other Edifices

Ireland is famous for the great number of her small ancient Celtic churches, which sometimes occur grouped together in the mystic number seven; examples still survive in part at Clonmacnoise, at Glendalough, on Scattery island, and other places. Also for her beautiful stone crosses, *e.g.* at Monasterboice, Kells, Cong, and over forty other places; her numerous raths and duns (ancient forts), cromlechs, tumuli, stone circles, megalithic monuments, and so forth. But none of her many archæological remains have excited greater interest or keener discussion than her eighty round towers, constructed of stone and

tapering as they go up. They were built as places of safety and defence when the Northmen, pillagers of monasteries, began to invade the land,¹ and thus date from the ninth century on to the thirteenth.

3. Towns

Dublin, "the ivied city," was marked out by its geographical position as the natural capital of Ireland; and accordingly, ever since the Northmen seized it, it has been the seat of the chief political power in the island. On the south, the picturesque mountains of the Wicklow system advance relatively close to the city. Dublin itself is intersected east and west by the Liffey, and north and south by the noble thoroughfare called Sackville Street. It possesses two ancient cathedrals, two universities (one of which, the Royal University, founded in 1880, is, however, only an examining body), a fine collection of Irish antiquities and ancient Irish MSS., the learned Royal Dublin Society (incorporated in 1750), and the former Irish House of Parliament, now the Bank of Ireland. Dublin Castle, strong, but without striking architectural features, is symbolical of English rule in Ireland, owing to its containing the offices of the Government. The viceroy's official residence is in Phoenix² Park. But although Dublin is the political centre of Ireland, her largest and most progressive town and busiest manufacturing centre

¹ This view, due to Dr. G. S. Petrie (*The Ecclesiastical Architecture of Ireland, including an Essay on the Origin and Uses of the Round Towers*, Dublin, 1845), is that which is now commonly accepted.

² This word has nothing to do with the mythical bird, but is derived from two native Irish words meaning "clear water," there being a spring in the park.



Laurence, photo.

DUBLIN : HACKVILLER STREET.

is *Belfast*, which owes its real foundation to Sir Arthur Chichester (1611), whom James I. sent over to superintend the plantation of Ulster. Since 1882 its harbour accommodation has been very greatly improved, and its commerce grows rapidly, the aggregate value for 1900 being $7\frac{1}{4}$ millions sterling. Belfast is a world-famous centre of the linen industry, and one of the chief seats

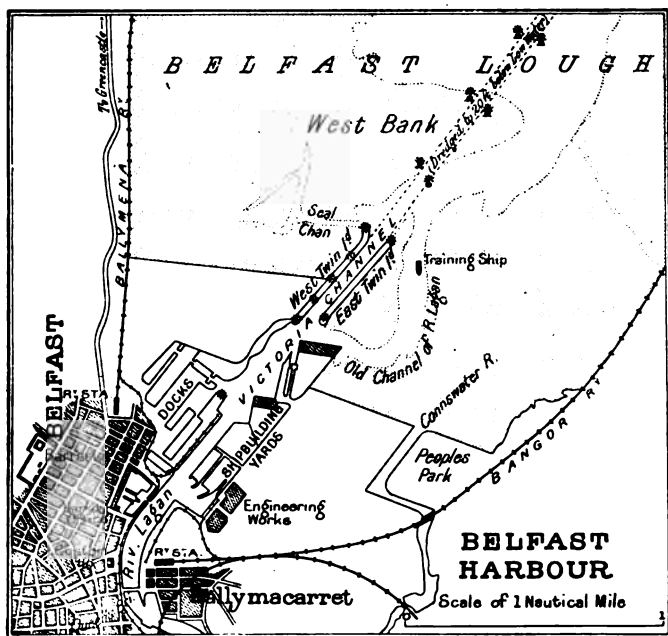


HIGH STREET, BELFAST.

Laurence, photo.

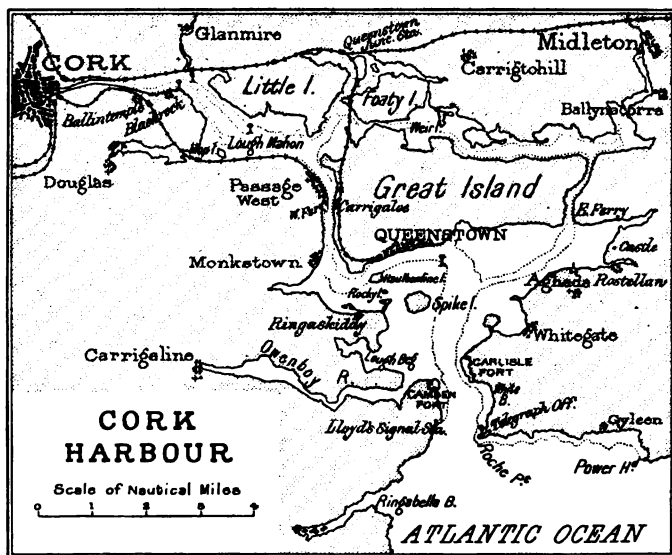
of iron shipbuilding in the United Kingdom. It also carries on distilling, and the manufacture of tobacco and ropes and cables on an extensive scale, besides other industries. There are fine banks and other public buildings, but none of exceptional interest. The third city of the kingdom is *Cork*, the chief town of Munster; it is built principally on an island in the river Lee, but has romantic scenery behind it. Some of its streets are broad, handsome, and well-built, but still more

are the reverse in every particular; it has two modern cathedrals. Although it exports large quantities of butter, bacon, and eggs, its importance as a seaport is somewhat eclipsed by *Queenstown*, which is a port of call for the great trans-Atlantic steamships. *Limerick* and *Londonderry*, the chief towns of the west and north



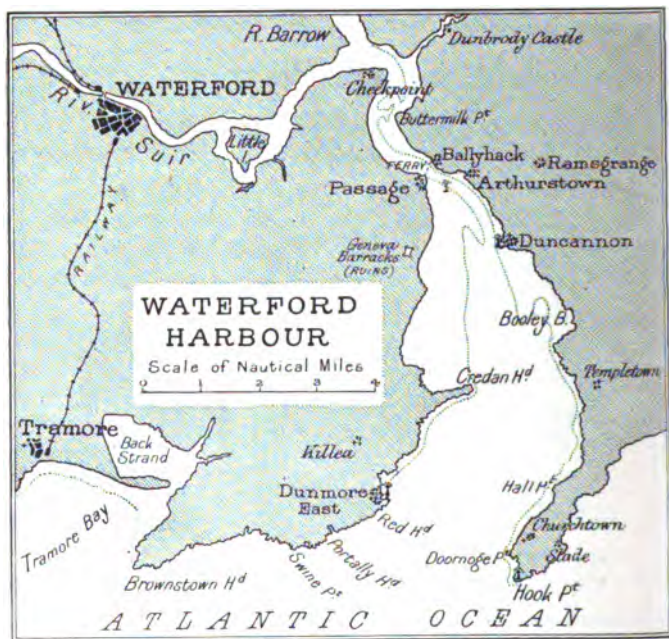
respectively, are both seaports, and both distinguished for famous sieges, the former being held by the Irish adherents of James II., under Sarsfield, against the forces of William III. in 1690-91, and the latter by the Protestants, animated by the Rev. George Walker, against the supporters of James II. in 1689. The conditions under which Limerick surrendered are alleged to have

been faithlessly violated, hence Limerick has been known in Irish history as "the city of the violated treaty." It is one of the best built towns in Ireland, and consists of three distinct divisions—the older English Town and Irish Town, and the more modern Newtown-Pery. Its chief architectural feature, St. John's Castle, is one of the finest Norman fortresses in the island. Londonderry



stands picturesquely on a hill overlooking the broad river Foyle, and is still surrounded by the historic walls. In the plantation of Ulster the old town of Derry, together with many broad acres, was granted to citizens of London, and its name changed to its present form. Shirt-making, fishing, and other industries are carried on. *Waterford*, a settlement of the Northmen, has excellent quay accommodation, and cures and ships large quantities

of bacon. Although one of the most ancient towns in Ireland, it possesses few archæological remains, except Reginald's tower and the cathedral, both founded by the Danes (Northmen) in the eleventh century. *Kingstown* is the port of Dublin ; its harbour is, however, artificially



constructed (1817-59), though a fine piece of work. *Galway*, or "Galloway" as Gerard Boate spells it (1652), is the chief town in Connaught, and in the architecture of its houses shows traces of the commercial intercourse with Spain, with which it had a trading monopoly for several centuries ; but its inhabitants were principally of Anglo-Norman descent, a strong colony from England

form a distinct community (in the Claddagh), and possess peculiar powers of self-governance. *Dundalk*, on the verge of the English Pale, formerly commanded the road between Dublin and Ulster. It exports farm produce and has various industries; as also has *Drogheda*, which, like Dundalk, was historically an important place. It is chiefly famous for the siege and sack by Cromwell in 1649. *Newry*, *Lisburn*, and *Lurgan* are all busy linen manufacturing towns in Ulster. Lurgan is especially famous for its linen-bleaching. *Wexford*, a Danish settlement, has narrow streets; it exports (from its new harbour of Rosslare) agricultural produce, and carries on fishing and other industries. *Sligo* is another port of the same character on the west coast. *Kilkenny* was a place of considerable importance in the fourteenth and fifteenth centuries, and long a stronghold of the English power, who built here a castle in 1192. It possesses several interesting old buildings, amongst them being the thirteenth-century cathedral, a round tower, and its college, in which Dean Swift, Congreve the dramatist, Bishop Berkeley, and other well-known Irishmen were educated. *Armagh*, the see of the Primate of Ireland, has been a religious stronghold since the days of St. Patrick, and had anciently one of the most famous schools in Ireland.

4. Fluctuations in the Population of the Towns, 1821-1901

The following table gives in thousands the population of the chief towns of Ireland since the first Irish census:—

Towns.	1821.	1841.	1851.	1901.	Towns.	1821.	1841.	1851.	1901.
Dublin .	186	233	258	289 ¹	Dundalk .	9	11	10	13
Belfast .	39	75	100	349	Drogheda .	18	17	17	13
Cork .	101	81	86	76	Newry .	10	12	13	13
Londonderry	9	15	20	43	Lurgan .	6	5	4	12
Limerick .	60	48	53	38	Lisburn .	5	6	7	11
Waterford .	31	23	25	27	Wexford .	8	11	13	11
Kingstown	1·5	7	10	17	Sligo .	9	12	11	11
Galway .	28	17	24	13	Kilkenny .	23	19	20	10

¹ Including suburbs (Rathmines and Rathgar, Pembroke, etc.) 373,000.

CHAPTER

THE LOCAL GOVERNMENT

IN the twelfth century, when Ireland was conquered by the English, its political system was completely changed, but under the influence of English institutions this custom has been preserved, so that Irish local government is still based beyond the fact that modern institutions correspond in area with ancient ones.

Under the political conditions existing in Ireland a system of local government, in which the people took little or no part, was in vogue a few years ago there was even less interest in local affairs there than was the case in England. The Acts of 1888 and 1894.

The Lord-Lieutenant of Ireland, acting on behalf of the Crown, appointed a lord-lieutenant in each county. The high sheriff was appointed every year, and to this body, with the larger landholders, were given the powers which a grand jury has in England. The functions of county administration were transferred to the local authority of any importance, and the Board of Guardians for the poor administered the poor law, and had

and duties as well. Of these guardians one-half were justices of the peace sitting in right of their office; and, although the other half were elected, the plural votes of the larger ratepayers nullified the popular voice even here. The towns alone had a form of government similar to that of English ones.

All this is now changed under the operation of an Act passed in 1898; and the local government of Ireland is now so much like that of England that it is only necessary to notice the differences, the principal of which are as follows:—

1. The Franchise

English local authorities are elected on several franchises—sometimes wider, sometimes narrower than that for the Imperial Parliament. In Ireland the franchise for all local government as well as parliamentary elections is the same, except that in local elections being a peer or a woman does not disqualify. Women are not allowed to be members of county councils: in this the law is as in England. Clergymen of all denominations are disqualified from being members of any local authority.

2. The Parish

In Ireland, as in England, there are both civil and ecclesiastical parishes. The ecclesiastical parish has little or nothing to do with local government, and the civil parish is of importance only as a rating area, and because it is the unit which, in combination with others like itself, forms larger and important areas. There is no parish meeting or parish council.

3. The County District

As in England, parishes are grouped into county districts: the area of the Irish district is on the average larger, and the population less, owing to the country being more thinly settled. The districts are divided into the two classes, urban and rural. In every such district there is a council popularly elected, but with power to add to itself two or three other members, which has the care of the public health, of all highways except main roads, and, in short, similar powers, duties, and liabilities to those of a district council in England. There is, however, one very important difference: an Irish rural district council cannot raise a rate, but gets money in grants from the county council, which subsequently recovers the money by a rate levied in the minor authority's area.

Urban district councils are not under this restriction, and have wider powers than rural ones—similar powers indeed to those possessed by an urban district council in England.

4. The Union

Guardians are elected in urban parishes: in rural parishes the district councillor is guardian also. Co-opted councillors are guardians as well as elected ones.

The rate is levied and raised by the county council.

5. The School District

Education is not everywhere compulsory, but only in towns, in urban districts, and in those rural districts which have applied to the county council to establish a school attendance committee. The expenses of the

school attendance committee are met out of local rates, and Parliament makes grants to efficient schools, but School Boards are not elected in Ireland.

6. The County Council

This is somewhat differently constituted from that of England. There are no co-opted aldermen, though there may be one or two co-opted councillors. The chairmen of the councils of the rural districts contained in the county have also the right to sit as members of the county council.

The powers, duties, and liabilities of the Irish county council, with regard to main roads and bridges, to the administration of the Food and Drugs Act, to the lunatic asylums, and to technical education are much as in England; but it has some others which do not fall upon English county councils.

Its duty to appoint a school attendance committee, if a rural district council asks it to do so, has already been noted. It has also the duty of providing county infirmaries and fever hospitals, and, if there is exceptional distress in a district, the county can make application to the Local Government Board to allow the administration of special out-door relief. If this is granted the county pays half the expense.

It has certain powers to take over and work tramways.

It levies one rate for all purposes: this is called a poor rate. As previously stated, it makes grants from this to the minor local authorities. The Government's annual subvention in aid of agricultural rates amounts for Ireland to £727,000 per annum. The county council has the distribution of this, as well as of the rate which it itself levies.

7. Boroughs

There are no boroughs in Ireland except the six county boroughs—Dublin, Belfast, Cork, Limerick, Londonderry, and Waterford. The other towns are either organised as urban districts or else, being very small, have not even this degree of independence. In this case they may be governed by elected commissioners, with very limited powers, or even be entirely absorbed in the county.

8. Municipalism

There has been a development of municipal enterprise in Ireland comparable to that which has taken place in Great Britain; but, on the whole, Ireland rather lags behind. Three of the county boroughs provide themselves with water, and one—Belfast—is supplied by a public trust, which acts also for the country around; three supply the electric light, three own their markets. Some of the smaller towns have shown a greater willingness to undertake services on behalf of their inhabitants. In particular we may notice that, although Dublin and Limerick are the only two county boroughs which have built artisans' dwellings, there are four urban districts which have done so. These are Drogheda, Kilkenny, Sligo, and Wexford.

A brief account of the municipal enterprises of the two largest Irish cities may be given for comparison with what has been said of cities in Great Britain.

9. Municipal Government of Dublin

Dublin is an ancient city. It was granted its first charter in 1171: it has received a great many charters

since, for almost every monarch has given one or more. It has a lord mayor and a sheriff. Nevertheless, the present body corporate dates only from 1841, and it was more recently still that the city was granted the privilege of collecting its own rates, which had previously been collected as part of the county rate. It still carries a load of debt contracted by the old unreformed corporation. In 1900 its area was extended from 3733 to about 8000 acres, and its rateable value thus raised from about £700,000 to about £850,000.

Dublin has a corporate estate, the rental of which, under the management of the present corporation, has increased from £15,000 to £25,000 per annum. It owns its four markets. These were rebuilt not long ago and slaughter-houses added. It owns its water supply, and has recently been making a new reservoir and laying a second line of pipes to increase the service: the rate for domestic purposes is only eightpence in the pound.

Dublin does not own its gas supply; but it was one of the first municipalities to establish works for the production and supply of electric current. It commenced operations in 1892. A large scheme for the extension of its electric lighting was adopted about the end of 1899.

The Dublin corporation has spent £100,000 in the clearance of insanitary areas. It has built artisans' dwellings and lodging-houses. It has also erected public baths and established public libraries.

Dublin has a technical school: the Corporation has recently decided to provide funds for the extension of the building. Besides its grants to this school the Corporation gives £2600 a year to the schools of science and art, and £450 a year to the municipal school of music in connection with the Royal Irish Academy. The

corporation is represented on the governing body of all these schools, and also on the Dublin Port and Docks Board, and on the Commissioners of Irish Lights.

10. Municipal Government of Belfast

Belfast is a comparatively modern town, its first charter having been granted by James I. in 1613, but it is now wealthier and more populous than Dublin. Its extent is about 6800 acres, and its rateable value considerably above £1,000,000. The last extension of its boundaries took place in November 1897. Belfast owns twelve markets and slaughter-houses. Its water, as mentioned above, is supplied by a public trust. Until very recently it was obtained from Woodburn and Strongford, places distant 10 or 12 miles from the city, but a third source of supply has recently been added: the waters of the rivers Annalong and Kilkeel are intercepted near their sources in the Mourne Mountains and carried to Belfast by a conduit some 40 miles in length. This conduit passes the town of Newcastle by a tunnel under the mountain near the town. Belfast owns its gasworks: the annual revenue is about £48,000. It has provided itself with electricity since 1895. It owns its tramways but has leased the working to a company. A scheme for their extension and for the introduction of a new traction has been adopted. At present there are 42 miles of track on which the cars run over 3,000,000 miles per annum, carrying about 27,000,000 passengers. Belfast has four bathing establishments. It adopted the Free Libraries Act in 1882. The central library now contains 33,000 volumes. In 1890 a museum and art gallery were also opened.

11. Administration of the Law

The law of Ireland, unlike that of Scotland, is essentially the same as the law of England, though there are many special Acts which apply to one country and not to the other, and many that do apply to both do so with modifications.

It has its own courts, but they are modelled on those of England. There is a Supreme Court of Judicature, consisting of a Court of Appeal and a High Court of Justice. The High Court of Justice is divided into several courts similar to those of the High Court of Justice of England, except that there is one called the Irish Land Commission, to administer the Irish Land Acts, and that there is no equivalent to the Court of Arches. Ireland has its own Lord Chancellor. The final court of appeal is the House of Lords.

12. Ecclesiastical Administration

More than three-fourths of the inhabitants of Ireland are Roman Catholics. Most of the rest are either Presbyterians—who are chiefly found in the north—or the adherents of the Protestant Episcopal Church, which from the Reformation until thirty years ago was the Established Church of Ireland. The Christian religion was introduced into Ireland in the fourth century by St. Patrick, who founded a church which at a much later date passed under the influence of Rome, as did the other churches of western Europe. At the time of the Reformation the Church of Ireland was reformed by Act of the English Parliament, but though the change was accepted by the ecclesiastics it was rejected by the laymen, and the congregations deserted the established church to attend the services of Jesuit missionaries.

Centuries of persecution did not shake the constancy with which the Irish people clung to the Church of Rome, but it embittered them against Protestants and Protestantism.

The brief period of political independence from 1782 to 1800 removed for the time being the disabilities of Irish Romanists, but did not alter the status of the established Protestant Church, but when, by the Act of Union, Ireland was re-united for political purposes to Great Britain, its church was also united to that of England, and no doubt it was as the result of this that the idea was formed in the minds of Irishmen that the established church was not the church of their fathers at all, but an alien church—the church of the hated English oppressor.

About the middle of the last century a powerful agitation arose against it, and at length, under an Act passed in 1869, it ceased, on the first of January 1871, to enjoy the status and endowments of an established church. The vested interests of its incumbents were provided for, and the surplus funds spent on hospitals, lunatic asylums, and for educational purposes.

CHAPTER XXXVII

BRITISH DEPENDENCIES IN EUROPE

THE Isle of Man and the Channel Islands are islands in the British Seas¹ subject to the English crown but having no representation in the imperial Parliament, and in almost all matters, including fiscal matters, self-governing.

1. The Isle of Man

This island, situated about midway between England, Scotland, and Ireland, as symbolised in its well-known crest of three legs, has a length of 33 with an extreme breadth of 12 miles. Its southern portion is mainly composed of rocks of Cambrian age, and is hilly or undulating with rocky cliffs for coasts, while the northern portion, about one-fourth of the whole, is composed of flat alluvium. The culminating point is *Snaefell* (2034 feet). The people depend largely on herring, mackerel, and other fisheries, but the two most populous towns, *Douglas* and *Ramsey*, probably owe the bulk of their population to their attractions as watering-places. The lead-mines at Laxey are the richest in silver in the

¹ Their aggregate area is 302 square miles, of which 227 square miles belong to Man and 75 to the Channel Isles. The aggregate population in 1901 was 150,600, of which nearly two-thirds belonged to the Channel Islands.

United Kingdom. Zinc and copper are also mined. The people of the island, known as the Manx, are of Celtic race, and a peculiar Celtic dialect has not yet died out. The island, after many political changes, was purchased from the Duke of Athole by the English crown in 1806. The administration is vested in the court of Tynwald, composed of a number of crown nominees, and a representative body called the House of Keys, which has the legislative powers for the island.

2. The Channel Islands

These are composed of *Jersey*, *Guernsey*, *Alderney*—or, as it is called in French, *Aurigny*—*Sark*, *Herm*, and one or two smaller islands lying near the coast of Normandy. They are the last relics left to the English crown of the Norman territories of the dynasty that came to the throne at the Norman conquest. They are mainly composed of gneiss, which has yielded a soil of no great natural fertility, but has been greatly improved by long-continued and assiduous industry, and the careful use of seaweed manure, and is now maintained at the highest degree of productiveness by the lavish use of artificial manures and by diligent cultivation. Jersey is mainly devoted to the cultivation of early potatoes, which, though produced at enormous expense, command correspondingly high fancy prices in the wealthy English and Scotch markets. Everything, however, depends on the date at which they can be marketed. Thus in 1900 potatoes sold before 12th May brought £31 a ton, but a week later the price had sunk to £19 a ton, and after 16th July it had fallen to as low as £3 a ton. After the potatoes are lifted, mangold or some other crop is sown on the same land and gathered in autumn. Both in

Jersey and Guernsey, but especially in Guernsey, enormous quantities of grapes, tomatoes, and other fruits are grown under glass. The islands are also noted for their peculiar breeds of cattle, the purity of which is jealously preserved. The Jersey breed, which is remarkably elegant in its form, is celebrated as a milker. The breed known as the Alderney, is that reared both on Alderney and Guernsey, and is also highly esteemed for the same property. A French patois is spoken more or less on all the islands, but the inhabitants take every opportunity, small and great, to demonstrate their loyalty to the English crown, and probably there is no part of the British Isles in which the Union Jack is so often to be seen flying in the breeze. Two lieutenant-governors represent the British crown in the islands—one for Jersey, the other for Guernsey, Alderney and Sark, but all these islands have more or less separate governments. The chief town of Jersey is *St. Helier*, that of Guernsey, *St. Peter Port*.

3. Gibraltar

The rocky peninsula of brown limestone or marble which forms the east side of the bay, 4 or 5 miles wide, known as the Bay of Algeciras in the south of Spain, has been an English possession since it was captured from Spain by Sir George Rooke in 1704. The rock rises precipitously, except on the west side, to the height of about 1440 feet. Its southern extremity, Point Europe, is just about 16 miles from the nearest point of the coast of Africa. On the west side is the harbour, and above it rises the town, which has been a free port ever since it came into English possession. The whole is strongly fortified, and two long galleries have

been pierced through the rock to establish communication between different parts of the fortress. In English history the fortress is famous on account of its defence against the French and Spaniards by Sir George Eliott, afterwards Lord Heathfield, in 1779-83. The rock is the only part of Europe in which a species of monkey is found running wild. The name of the rock is a corruption of Jebel-al-Tarik, that is, the mount of Tarik, the leader of the great Moorish invasion of Spain in 711, and is due to the fact that here the invader first established himself in a fortified camp.

4. The Maltese Group

Between Sicily and the African coast lies the Maltese group, belonging geographically to Italy, and politically to England. The islands composing the group are *Malta* (the ancient *Melita*), *Gozo*, and *Cumino*, the last deriving its name from the cumin grown there. They are mainly formed of Miocene limestone strata, in great part artificially provided with a thin covering of soil collected from cracks, crevices, and pot-holes in the hard rock.¹ They have steep shores on the south, and are without hills or rivers.

One of the most interesting facts in the natural history of Malta is the discovery that at a comparatively recent period there existed in the island at least two kinds of *pigmy elephant*, the bones of which are found in deposits of post-Pliocene age. The so-called "donkey elephant" (*Elephas Melitensis*) was only between 4 and 5 feet height, while another species, called *E. Falconeri* (¹

¹ For details as to the geology of the group, with a map, see a paper by Sir John Murray in *Scot. Geog. Mag.* 1890, p. 1

was not more than $2\frac{1}{2}$ or 3 feet high. The discovery is of special interest, as proving that at the time indicated the islands must have been connected with the mainland, since such animals could not live on an area so circumscribed as Malta now is.¹

The rainfall in the island is about 20 inches per annum. The population is very dense, upwards of 1500 to the square mile, not including the military, and hence the people are necessarily very industrious, carefully cultivating the scanty soil in the face of great natural disadvantages. Cereals, potatoes, and numerous fruits, including the well-known "mandarin oranges," are cultivated; but almost the only tree in Malta is the carob or locust tree (*Ceratonia siliqua*), the fruit of which is largely eaten by cattle. Cotton is cultivated, and a species of clover (*Hedysarum coronarium*) is remarkably luxuriant. Extensive water-works, including provision for irrigation, have been taken in hand. The language of the people is a much mixed and corrupt Arabic, but Italian is largely spoken by the educated classes, and English is rapidly spreading. As is only natural from the position of these islands, they have changed owners too frequently for these changes to be mentioned. From 1530 to 1798 they were in the possession of the Knights of St. John of Jerusalem, to whom they were granted on the expulsion of the order from Rhodes. In 1800 they were taken by the British from the French, and they have been a British possession ever since. The capital of Malta is *Valetta*, which is strongly fortified, and has a fine harbour, and is important as a naval and a coaling station. A railway on the metre gauge, 8 miles long, runs thence westwards to *Città Vecchia*. To the west of *Valetta* is

¹ See Wallace, *Distribution of Animals*, chap. x.; Leith Adams, *Wanderings of a Naturalist in India*, p. 216.

the Porto di
shipwreck des
town of Goz
total area of
main island, 9

CHAPTER XXXVIII

THE SCANDINAVIAN PENINSULA

1. Physical Conformation

THE Scandinavian Peninsula is the north-west rim or shoulder of the primeval European continent, but is now separated from the rest of the mass by the shallow depression of the Baltic. Although divided politically between Norway and Sweden, 42 per cent of the area belonging to the former, and 58 per cent to the latter,¹ the peninsula is geographically a fairly homogeneous region. Its main axis is formed by an elongated plateau, having an average elevation of 2000 to 4000 feet, about 100 miles broad, and running throughout parallel to the west coast at a distance of 60 to 150 miles from it. On the west the plateau plunges abruptly into the sea, and is penetrated by a vast number of narrow rifts, which in very many places cut almost sheer down to the water's

¹ Area of entire peninsula, 298,042 square miles; of Sweden, 173,547 square miles; of Norway, 124,445 square miles.

Population of Sweden:—1,878,000 (1755); 2,347,000 (1800); 4,099,000 (1865); 4,785,000 (1890); 5,136,000 (1900), giving a density of 30 inhabitants to the square mile and a mean rate of increase since the previous census of 0·71 per cent per annum.

Population of Norway:—727,600 (1769); 883,000 (1801); 1,490,000 (1855); 2,001,000 (January 1, 1891); 2,240,000 (December 3, 1900), giving 18 inhabitants to the square mile and a mean rate of increase since the previous census of 1·13 per cent per annum.

edge, with perpendicular or well-nigh perpendicular walls. These are the fjords. On the east the peninsula is flanked by a broad gradually sloping terrace, or secondary plateau, geologically a continuation of the plateau of Finland, which, after dipping under the Baltic, strains upwards towards the mountainous backbone of the Scandinavian peninsula.

Altogether the peninsula stretches over more than fifteen and a half degrees of latitude ($55^{\circ} 20'$ to $71^{\circ} 7'$ N. lat.), and penetrates some four and a half degrees beyond the Arctic Circle. The maximum breadth is considerably under 500 miles; the average breadth about one half of this. The length of the very irregular coastline has been estimated at over 6000 miles, without taking account of the minor inlets. The land frontier, conterminous with the north-west boundaries of Finland and Russia, measures about 900 miles. Everywhere, except in part along the south, the shores of the peninsula are protected by a belt of rocky islands, "the skerry fence" (Norwegian *Skjærgaard*; Swedish, *Skärgård*). The political boundary between Norway and Sweden is everywhere purely conventional. The real dividing line winds along the barren wastes of the mountainous plateau, and along its southern offshoot, which trends down towards the Kattegat.¹ Indeed, there was no political boundary at all until 1751, and the boundary between Norway and Russia was only demarcated in 1826.

2. The Highland or High Fells

The plateau which constitutes the backbone of the Scandinavian peninsula does not form a continuous, or

¹ Compare what is said as to the Anglo-Scottish boundary, on p. 270.

even a distinctly marked, mountain range, but is carved by deeply trenched valleys, glens, and fjords into a great number of smaller plateaus; so that the name of Kjölen, *i.e.* "the Keel," which has been generally given to it north of 62° N. lat., is a misleading appellation. There is no keel-like ridge; indeed, the highest elevations do not invariably coincide with the watershed. For standing upon the plateau as a base, and towering 3000 to 4000 feet above it, are numerous individual peaks, many, especially in the north, presenting features of Alpine ruggedness and grandeur, as for instance Kebnekaisse (7005 feet), the loftiest altitude in Sweden, though not in the peninsula, Sulitjelma or Sulitelma (6160 feet), and Sarjektjåkko (6970 feet). The two last-named, as well as a few others in the north of the Highland, as this mountainous region is collectively called, are covered with perpetual snow and in part mantled with glaciers. One of these, Svartisen ("the black ice"), is nearly 400 square miles in extent. North of 70° N. lat. the altitude of the peaks sinks to less than 3500 feet. All these higher regions are barren, desolate wastes, the summits of the mountains bare and rounded in outline, and the spaces between the mountains themselves for the most part treacherous bogs or marshy moors.

Immediately below lat. 64° N. the Highland is interrupted by the Trondhjem depression, which cuts into it from the west in the shape of a sickle. Here the mountain background sinks as low as 4000 feet.

At this point the Highland plateau swings away to the south-west, and, keeping about 100 miles distant from the Norwegian coast, marches southwards, under the general name of the High Fells or the Wide Wastes, almost to Lindesnäs, the extreme south-west corner of

mountains, are better known by various local titles, as the Dovre Fjeld, the Rondeine¹ (Rondane or Rundane) Mountains, the Lang Fjeld (Fjelde), Jötun (Jotun) Fjeld, Fille Fjeld, and Hardanger Vidden, the summits of which exceed 6000 feet. Snæhæten or Snehätta ("snow-cap"), in the Dovre Fjeld, is 7570 feet high; but the culmina-



THE JOSTEDAL GLACIER, KJENDALSBRÆ.

Valentine, photo-

ting altitudes of the entire peninsula are found in the Jotun Fjeld or Jotunheim ("home of the giants"), Galdhöppigen being almost exactly 8400 feet, and its near neighbour Glittertind or Glitretind ("glittering peak"), 8370 feet. Below 60° N. lat. the mountain summits drop rapidly to 4500 feet, to 3000 feet, to less than

¹ There are great differences even in the official spellings of Norwegian names. The spellings first given, where there are alternatives in the text, are those of the latest Government survey map.

1000 feet. On its west side Jotunheim is crowned by the largest glacier on the continent of Europe (see, however, "Iceland," p. 716 below), namely Jostedalsbræ, 580 square miles in area. Another large glacier, the Folgefond (110 square miles), lies within a huge bend of the Hardanger Fjord, on the western edge of the Hardanger Vidda or Vidden ("wide waste").

"The Highlands (the roof of Norway) vary infinitely in character. Many of moderate elevation (say under 3000 feet) are of moor-like aspect, rolling, broken ground, clad for miles around with wiry scrub of dwarf birch, creeping willow, and such-like Alpine plants, with numerous tarns and patches of bog interspersed. Snow only lies here in patches on the northern faces, whereas on the higher fjeld it remains in wreaths (or *snæfonds*) and unbroken sheets throughout the year. On really high fjeld, snow seems to alternate only with naked faces of bed-rock, black as Erebus, or chaos of tumbled boulders. Plant-life is restricted to lowly forms, such as reindeer-moss and lichen, with the puniest of stunted shrubs and cryptogams. Yet even here are scattered oases of fell meadow and pasturage, where in some sheltered glen one finds grass and wild flowers quite luxuriant. These (if within reach of the nearest valley) are occupied by *sætters*, the summer shielings of the peasantry, who, during July and August, ascend thither to graze their cattle and goats, to make butter and cheese, and to gather into stacks or sheds as hay the crop of grass and mountain plants. The produce is afterwards conveyed on sledges¹ to the valley when the first snows permit. But during some

¹ In many parts of the west coast the favourite method is to gather the hay into bundles, and in summer slide the bundles down a long sloping wire, which stretches from the edge of the fell to a windlass in the valley below.

ten months out of the twelve the fjeld is deserted by man; while there are yet higher regions, and others whose extent precludes even this intermittent form of agriculture, and which are abandoned to the sole possession of an Alpine fauna."¹

3. The Forest Region

This is the general name given to the secondary plateau which sweeps down from the Highland and High Fells to the Baltic, the Kattegat, and the Skager-Rak. Its average elevation lies between 600 and 1500 feet, and it is furrowed throughout by a multitude of streams flowing in parallel courses, in Sweden generally in a south-east direction, in Norway mostly south. Putting aside the Norwegian river Glommen, the longest river in the peninsula (350 miles), the streams of the Baltic basin do not vary greatly in length (130 to 280 miles), nor in their total fall (1150 to 2850 feet). As a rule, after quitting the Highland, which they frequently do by churning through a cataract or hurling themselves over a fall (*e.g.* Harsprång and Stora Sjö falls in the Lule river; Tänn and Ena "forces" in the Dal; Trollhätta in the Göta; and Rjukan in the Skien), they flow through fairly flat and open valleys, the sides of which are heavily clothed with pine and fir and birch. Many of them expand into long ribbon-like lakes, which in Sweden² are generally formed at the foot of the Highland escarpment (Lule Träsk, Hornafvan, Stor Sjö), but in Norway, near the outer margin of the Forest Region (*e.g.* Mjösen,

¹ A. Chapman, *Wild Norway* (London, 1897), pp. 5, 6.

² For descriptions of these, read Frederika Bremer's *I Dalarne* (English trans. 1852), and Selma Lagerlöf's *Gösta Berling's Saga*, 1891 (English trans.).



Stereoscopic Co., photos.

HERD OF REINDEER.

Randsfjord, Tyrifjord), at an elevation of about 400 feet above sea-level. Lake Fæmund, in the east of Norway, is a striking exception to this rule; it lies at an altitude of 2200 feet, nearly a thousand feet above the average level of the Swedish Forest lakes, and many miles deep in the heart of the Forest Region.

The Forest Region is separated from the Gulf of Bothnia by a belt of moraine sands and clays, some 30 to 100 miles wide, and 50 to 80 feet in average altitude. These were laid down on the floor of the sea during the Glacial Epoch, and have been since then lifted out of the water by the secular elevation of the peninsula, the rivers gradually eating their way down as the land rose. The deposits thus formed in the lower courses of

the river valleys furnish almost the only cultivated tracts in Northern Sweden. Upon them, or more frequently upon the terraces above them, stand the string of little seaports to which the timber cut in the Forest Region behind is floated down to be sawn, shaped, and shipped. Except the wood-cutters and raftsmen, the dalesmen in the valley settlements, and the miners of copper and iron (see section 8 below), the only inhabitants of all the vast Forest Region are a few hundreds of wandering Lapps (see section 12 below). Foxes in great numbers, the elk, reindeer, glutton, lynx, and some few bears and wolves, together with the lemming, ptarmigan, blackcock, capercailzie or wood grouse, hazel grouse, willow grouse, royal eagle, hawks, falcons, owls, and numerous aquatic and smaller birds, are the creatures which principally inhabit the Highland and the wildernesses of the coniferous forests. Several kinds of berry bushes grow on the edges of the moors and bogs, and on the higher ground wherever they can find sufficient soil and shelter.

The climate in the Highland (High Fjelds) and Forest Region is, on the whole, one of extremes, milder of course in the southern latitudes than in the northern; but there are two poles of extreme cold, one in the interior of the relatively low plateau of Lapland, having for its centres Karasjok and Kautokeino, the other in the valleys of Eastern Norway, around Røros and Tønset. The summers are short, not longer than two months in the extreme north; but their shortness finds great compensation in the almost constant duration of the sun above the horizon, and its high, to some extent cumulative, heat force, producing upon vegetation something of the same effects as a longer summer with less continuous sunshine. At Jockmock, for instance, just above the Arctic Circle, there

are stated¹ to be more hours of sunshine in June than at either Rome or Madrid. A maximum summer temperature of 86° is often reached all over this area. In the two poles of cold the thermometer in the months of December, January, and February shows an average mean of 8½° to -4° Fahr. in the Norwegian centres, and 3° to -14° in the Lapland; the lowest records being -50° and -60½° respectively. The lakes remain frozen from 115 to 190 days in the year; the rainfall varies from 24 inches in lat. 60° to between 16 and 12 inches in Lapland.

4. Southern Sweden—The Great Lakes

In the south of Sweden the great forest-clad plateau is interrupted by a broad depression, which stretches from the head of the Kattegat to the lower end of the Gulf of Bothnia, and at the close of the Glacial Epoch was virtually an arm of the Baltic, but is now in part filled by four large and several smaller lakes. Vetter or Wetter (730 square miles) goes down to a depth of 390 feet. Vener or Wener, the largest, with 2150 square miles, is 290 feet deep. Mälär is thickly studded with islands, and with its royal castles and noblemen's country seats peeping out from amongst the trees, is one of the loveliest sheets of water in Northern Europe; it is only 210 feet deep, and is 450 square miles in area. The fourth large lake, Hjelmär, measuring 185 square miles, is even shallower, not more than 60 feet in its deepest part. On the whole, this region is tolerably level, the highest elevation being Mount Kinnekulle (990 feet), on the south-east shore of Wener—a spot which figures prominently in Swedish legend. Across these low plains of middle

¹ By Dr. N. Ekholm, in *Sveriges Land og Folk*, p. 24.

Sweden the Glacial Age has drawn great numbers of *dsar* (kames or eskers), sharp-crested ridges of rolled gravel, 100 to 200 feet high, their sides usually planted with forest, which stream for miles over hill and across dale in tolerably straight lines from north-west to south-east.

This region has always formed the heart of the Swedish kingdom. Here has been for centuries the seat of political power and of learning, and in virtue of the iron mines the source of the chief wealth of the people.

South of the lake depression comes the Småland Highland, a region which, despite the name, is "a direct continuation of the continental plateau [Forest Region] of Northern Sweden. . . . The river valleys are, indeed, neither so wide nor so deeply cut through the Archæan rocks; which prevail here as they do in Norrland. The rock-bed is almost everywhere covered by somewhat refractory moraine deposits, but little adapted for cultivation, and between the higher parts of which stretch wide boggy moors. The landscape presents a character in every respect so closely resembling the natural features of the middle belt of Norrland, that a stranger could scarcely distinguish between them. There are the same broad forests of fir and pine, with a thin sprinkling of deciduous trees around the scattered settlements, the same desolate swamps diversified by patches of scraggy fir, the same alternation of moderate hill and dale. The only difference is in the more favourable climate, which renders here a more varied cultivation possible."¹

Sweden terminates in the south in the peninsula of Skåne, Skaney, or in its Latinised form Scania; whence "Scandinavia." In many respects this region differs from the rest of the peninsula. It is not only in part

¹ *Sveriges Land og Folk*, ed. by G. Sundbärg (Stockholm, 1901), pp. 18, 19.

flat, in part gently undulating, being built up principally of Triassic, Jurassic, and Cretaceous formations, with traces of Tertiary deposits and Tertiary volcanic activity. but it contains the most fertile land in Sweden. Consequently it is the most densely peopled. Amongst its characteristic features are beech-woods and the detached homesteads of the well-to-do peasantry, built, not of wood, as in other parts of the country, but of stone, and roofed with tiles, standing in the midst of scattered groves of trees and fields inclosed with hedges.

5. The Skärgård or Skjærgaard

The "skerry fence," or belt of islands, runs all down the east coast and along part of the west coast of Sweden, and stretches with scarce an interruption along the south and west coasts of Norway from the Kattegat to the North Cape. Setting aside Gothland and Öland, the Baltic Skärgård consists principally of islands of small size but countless number, many of them, owing to their rugged outlines, their fertile soil, the abundance of oaks, and of spruce, fir, and other Coniferæ, and the wonderful purity and limpidity of the sea-water, possessed of very considerable natural beauties. "Nothing can excel these islands in that peculiar blending of forest, brushwood, and meadow which is so specially characteristic of the North. The roads, called 'dregs,' are tunnels of greenery winding through groves of intermingled birch and fir, with the tassels of the hazel dripping from overhead. You could fancy you were walking in an English park, until you come all of a sudden upon the sea-cliff, with its pines and firs and moss, and at its foot the little cove and strip of sand braided with seaweed. The inner ramifications of the bays are everywhere bordered with fine alders and

beds of reeds. . . . The people who inhabit this maritime province consist of three classes—those who carry on agriculture, principally on the larger islands; those who both cultivate the soil and engage in fishing; and—the poorest class—the Skärgårders *par excellence*, who depend for their livelihood almost entirely upon fishing and hunting, but at the same time keep a cow, a sheep or two, and a few head of poultry.”¹

Both Öland (520 square miles) and Gothland (1140 square miles) are built up of Silurian limestones and marls, which were laid down in horizontal strata, and afterwards, during the Ice Age, overflowed by the sea. The greater part of the latter island is covered with pine woods, which embrace in their arms numerous clearings of meadow-land. On parts of the west coast the perpendicular limestone cliffs have been sculptured by the sea into curious detached, rounded, and tapering columnar buttresses. The middle of Öland is a barren, treeless, limestone plain called Alfvaret, from which the surface slopes away gently seawards on both sides.

The coast of Scania, and the (Swedish) coast of the Sound and the Kattegat, differ from the coasts in all other parts of the peninsula. Not only are they unprotected by a *skärgård*, but they are tolerably regular and open in outline, and in many places the wind has fenced the shore with sand-dunes. But north of 57° N. lat. the island belt begins again; though the islands of the western Skärgård of Sweden wear a very different appearance from those of the Baltic. The trees have mostly been felled, and the surface consists principally of bare and inhospitable rock.

Those islands of the Norwegian Skjærgaard which lie

¹ A. Strindberg, *Skärkarlsöf* (Stockholm, 1888), Introduction, pp. xi.-xiv.

farthest out, fully exposed to the buffeting of the Atlantic, are also destitute of vegetation, bare, polished, as it were "a world of weird, fantastic creatures, suddenly petrified by some caprice of necromantic power;" and many even of the islands which lie close in to the shore partake of the same characteristics. But on those which chance to possess nooks sufficiently sheltered from wind and wave vegetation grows luxuriantly. In the summer numerous sheep are grazed on the grass they produce, and on the Vesteraalen group, as far north as lat. 68° - 69° N., sheep are sometimes left out on the fjeld pastures all through the winter. The group just mentioned, to which belongs the biggest of the islands of Norway, Hind or Hinn (860 square miles in area), as well as its neighbour group to the south, the Lofotens, from which it is parted by the narrow Raft Sound, both possess some of the grandest fjeld scenery along the entire coast. And the wildness of their fjeld landscapes—the Lofotens reach an altitude of 4155 feet—is enhanced by the still greater wildness of the seas which beat upon them. On the south, or rather on the south-east, their shores are washed by the Vest Fjord, which is not so much a fjord as an arm of the Atlantic, and is not only subject to tempests of sudden and appalling violence, but is dangerous by reason of the swiftness of its currents, sometimes giving rise to "races" of whirlpool velocity, such as the Mælström¹ and the Saltström. In spite of the perils of these waters, some 20,000 to 40,000 men gather here every January to fish for cod; and the chronicles of the long years during which this fishing has been carried on tell of many an awful day of gloom, when hundreds of brave men

¹ Described by Edgar Allan Poe imaginatively in *A Descent into the Mælstrom*, and by the Scoto-Norwegian poet, Peder Dass [Dundas], in *Nordlands Trompet* (1739).

have perished at one fell swoop of the ravening tempest.¹ The only remarkable seam of coal as yet known in Norway exists on the island of And in the Vesteraalen group.

The presence of this island fence all along the Norwegian coast is of the very first importance for navigation, in that it secures an inner belt of roads, which are smooth and safe in all seasons, and which never freeze in winter.

6. Climate of the Coastal Strips

This immunity from ice is due to the prevailing south-westerly winds, and the corresponding drift of ocean waters from warmer latitudes. From the same causes the climate of the west coast of Norway is everywhere appreciably higher than the latitude would normally imply, and all the more since high temperatures are maintained through the liberation of latent heat, due to the condensation of water-vapour brought in immense quantities by the winds referred to. For instance, at all the out-coast stations south of Trondhjem Fjord, the annual mean temperature is $44\frac{1}{2}^{\circ}$ to $45\frac{1}{2}^{\circ}$ F. North of Trondhjem Fjord the annual mean gradually decreases; but the decrease is most marked beyond the North Cape, the annual mean sinking to 33° at Vardö, while the winter mean at the same station is as low as 21° . On the west coast generally July and August are the warmest months; February the coldest. The rainfall at some places, *e.g.* Bergen and Florö, is between 70 and

¹ Graphic accounts of the storms and fisheries of this part of the coast may be read in Jonas Lie's *Den Fjendsynte* (Copenhagen, 1870); H. Schultze's *Fra Lofoten og Solør*, in his *Udvalgte Skrifter* (Christiania, 1883); and in *Harham, et Exempel fra Fiskeri-Districterne*, by Eilert Sundt, printed in *Folketællingen*, 1858 and 1859.

80 inches annually; but it diminishes northwards, being 39 inches at Tromsö and 20 to 24 inches on the coast of Finmark. The summers are, of course, favoured



NORTH CAPE.

with an exceptional quantity of sunlight. At Trondhjem there is broad daylight at midnight from 23rd May to 20th July; at the North Cape the sun is continuously above the horizon from 12th May to 29th July. On the other hand, the winters are correspondingly

lacking in sunshine; for it is not seen at all from 26th June and at Trondhjem the snow lasts from 1.30 A.M. to 2.30 P.M.

In the south of Sweden the climate is almost the same as the temperature of Norway south of Trondhjem. Wisby, on the island of Gotland, is on the Sound $44\frac{1}{2}^{\circ}$. But along the coast the water adjacent to the shore cools in the middle of November to the mean drops very appreciably to $42\frac{1}{2}^{\circ}$, but at Umeå it is down to $32\frac{1}{2}^{\circ}$. The winter mean of the Gulf of Bothnia, is 1.30 on 21st October and lasts un-

7. The Fjords

These are the deep, narrow fjords, the wind so many miles into the interior of the peninsula, often between black cliffs which tower up sheer from the water to a height of 2000 or 3000 feet, and the sun or else shoot up at a very sharp angle, and filling the watery depths.

The primary origin of the fjords is a matter of speculation;¹ but there is no doubt that the glaciers of the great Ice Age, when they charged themselves, they did so in great gutters, ready drawn in the east. The longer the (Norwegian) fjords, the more the And as some of the fjords pene-

¹ See vol. i. pp.

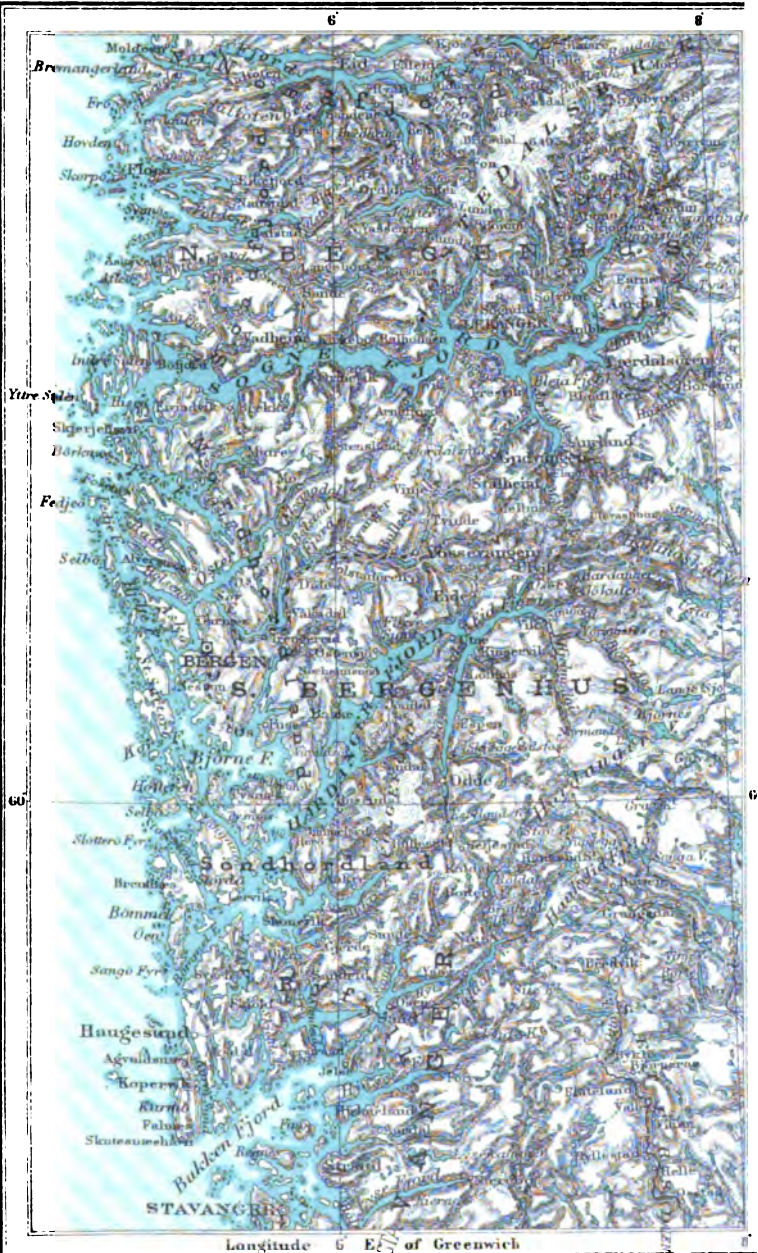
so do they reach a corresponding distance downwards. For instance, Sogne Fjord, which is 136 miles long, attains a depth of considerably over 4000 feet. Hardanger Fjord, the beauty of which has been sung by Welhaven and other Norwegian poets, is 114 miles long and over 2100 feet deep; and Stavanger, Nord, and Vest Fjord each goes down to a depth of between 2000 feet and 2300 feet. Farther north, however, especially



SEVEN SISTERS' FALL, GEIRANGER.

when the relatively low plateau of Finmark is reached, the depth decreases to about 1400 feet; *e.g.* this is the case in Ranen, Alten, Varanger, and others. But the fjords which lie west and east of the North Cape, and which pierce the low plateau of Finmark and Lapland, namely Porsanger, Laxe, Tana, and Varanger, as well as Christiania Fjord in the south, are scarcely fjords at all, but rather ordinary bays, being wider and altogether more open, as well as shallower, than the west coast fjords. On the average the latter vary between 30 and

THE FJORDS AND SKERRIES OF SOUTHERN NORWAY



Scale of Miles

0 10 20 30 40

Stanford's Geog. Estab. Lond.

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60 miles in length. Their waters are shut off from the abysmal depths of the Atlantic by a broad submarine rampart, 50 to 60 miles wide, and only 500 to 600 feet below the surface of the sea, which has been built up of moraine deposits from the great glacier streams. And as this barrier extends without a break all the way from Stavanger (Bukkn) Fjord to the North Cape, each fjord is thus virtually converted into a self-contained basin, in which various types of an arctic semi-pelagic fauna have been preserved. At the heads of the fjords, as well as all along their sides, and in the valleys which form their landward continuations, the rocky walls are often beribboned with waterfalls (*fosser* or "forces"). Vetti, Vöring, Skjæggedal, and Fiskem are the best known.

At many places all along the west coast there are plain indications of a former beach line, now raised 30 to 60 feet above the existing sea-level. This marks the limit of human habitation and of the cultivation of the soil.¹ Above the ancient beach line there are no deposits upon which crops can grow.

8. Geology—Minerals

The Highland and Forest Region, Småland, and the lake depression of Sweden, that is to say, almost the entire peninsula, are of extremely ancient origin. Their base consists of Archæan formations, in which gneiss, granulite (*hülleflinta*), and granite are the predominant rocks; the other rock constituents being principally syenite, crystalline limestones, gabbro, porphyry, diorite, and hyperite. Next in point of antiquity come certain pre-Cambrian strata, lying tolerably horizontal, chiefly

¹ *Norway, Official Publication for the Paris Exhibition, 1900* (Christiania, 1900), p. 32.

red sandstone, with clay slates and conglomerates, and in the main plateau large developments of mica-schists and quartzites (Seve group). Above these again come thick deposits of fossil-bearing sandstones, limestones, clay-slates, and conglomerates, which were laid down on the floor of the sea during the Cambrian and Silurian periods. Subsequently these deposits were not only lifted above sea-level, but they were also profoundly altered by the upward thrusting, compression, and folding of the underlying Archæan rocks.

Swedish iron is amongst the best in the world for forging into steel,¹ as well as for use *qua* iron. For centuries the ore has been mined in various parts of the lake depression, as at Dannemora, Grängesberg, and Norberg, and in Vermland. And within recent years, more especially since the building of a railway (finished in 1888) to the head of the Gulf of Bothnia, iron ore has been mined in very large quantities at Gellivare, Kirunavara, Luossavare, and the neighbourhood in the wilds of Swedish Lapland, a long way within the Arctic Circle. But a railway, 150 miles long, is now (1902) in process of construction from Gellivare over the Highland wastes to Ofoten Fjord, on the west coast of Norway, by which means an ice-free port (Victoria Harbour or Narvik) will be secured for winter shipments. Norway has now only two iron mines, one near Arendal, the other near Skien. The next most important mineral is copper, which is mined not only at the famous mine of Falun, but also at Åtvidaberg, near Westervik, in Sweden, and at Röros, Sulitelma, Lyngen, Killingdal, and Ytterö, in Norway. Deposits occur at several other places in both countries; and some of them, for instance those at Dunderland, at the head of Ranen

¹ Swedish iron and steel are both largely imported into Great Britain.

fjord, are likely to be mined to a great extent now that a process has been devised for making briquettes containing at least two-thirds of pure iron, by crushing these low-grade ores, and then compressing the particles more highly charged with iron after they have been separated out by magnets. Some zinc is extracted at the north end of Lake Wetter and at the head of Saude Fjord near Stavanger. Coal is mined in the extreme south of Sweden, in the district of Skåne. For many generations silver-mining has been the chief industry of Kongsberg in the south of Norway, and at Sala, west from Stockholm. Various other minerals exist in the peninsula, but though some are worked intermittently, none are extracted in steadily paying quantities.

9. Ethnology, Language, Mediæval Trading-towns

Excepting the Finns and Lapps, the inhabitants of the Scandinavian peninsula belong to the Teutonic division of the Aryan race. Even as late as the tenth century one and the same language, the tongue known as Old Norse, was spoken by all the Scandinavian peoples, Danes included. It was a speech which seems to have been closely akin to Anglo-Saxon; at any rate the sagawriters assert that the language which was spoken in Norway was understood in Bretland (England), and the language of Bretland as readily understood in Norway. Since that period Swedish and Norwegian have drifted a good deal apart, and now differ not only in grammar and construction, and to a considerable extent also in vocabulary, but still more in their spirit, in their literary traditions, and in their literary standards. Swedish has been, at different periods, influenced by Low German and by High German, and its literature has drunk deep at the

wells of the French classical style. For generations (since 1536) the official language of Norway was Danish; and Danish, intermingled with local dialects, or alternately with them, and spoken with a different accent, was the language of the people. But since the literary revival which began a generation after the separation from Denmark (1814), and which received a greatly quickened impulse from the writings of Ivar Aasen, Asbjørnsen and Moë, Ibsen and Garborg, the language spoken, and still more the language written, in Norway has shown a tendency towards an independent development, that is along different lines from Danish.

The first historic accounts we have of the inhabitants of the Scandinavian peninsula carry us back to the Iron Age, or (say) the period between 500 B.C. and the middle of the eleventh century. The last 350 years of this period were coincident with what is known as the Viking Age, of which there exist voluminous and highly interesting accounts in the literature of the Sagas. But almost equally important for a knowledge of that stirring epoch are the abundant relics of the burial-mounds, which have survived in all the Scandinavian countries alike. From these sources, and from bog-finds, kitchen-middens, rock inscriptions, etc., it appears that the population of the Scandinavian peninsula was at that period distributed pretty much as it is now. Then, as now, they were a maritime race, and dwelt in scattered homesteads not far from the sea, on river, creek, fjord, bay, or lake. Then, as now, the vast inhospitable forests were a formidable barrier to ready communication.¹

Now the Viking was not only a warrior, he was also an enthusiastic trader; and next to the venerated

¹ See *The Story of Egil Skallagrimsson*, trans. by Rev. W. C. Green (London, 1893), more particularly chap. lxxiv.

temples of the gods ranked the trading-towns. Thither came merchants bringing wares from Bretland, from Iceland, from Bjarmeland (near the White Sea), from the countries all round the Baltic, from Saxland (Netherlands, Westphalia, etc.), from Wendland (Mecklenburg and Pomerania), from Vinland (north and west of France), and even from Serkland (Saracens' land, i.e. the Orient), from Myklagaard (Byzantium), and from Gardariki (Novgorod the Great) and Kōnugaard (Kieff). Constant communication was kept up with England—indeed a distinguished Norwegian scholar¹ implies, that it was from this island the civilisation of the North principally drew its inspiration and its sustenance,—with Southern Europe by way of the German rivers, and with the Orient up and down the great rivers of Russia. These last two streams of traffic converged upon Bornholm and Gothland respectively. On the latter was the most considerable trading-town in the North, namely Wisby, not only during the Viking Age, but apparently for centuries before, as it was, and even with a greatly enhanced reputation, under Hanseatic influences, for some centuries afterwards.² From Wisby the trader steered farther north for the famous market of Björkö (Birka), situated on an island in Lake Mälär, and after the destruction of Björkö in the year 1000 to its commercial successor Sigtuna, about half-way between Björkö and Upsala; for Upsala was then, as it is now, the religious capital of Sweden, and both Upsala and Sigtuna (or Björkö) were

¹ Prof. Sophus Bugge, in *Helgeligtene i den Ældre Edda, deres Hjem og Forbindelser* (Copenhagen, 1896).

² Over 10,000 pieces of Anglo-Saxon coinage of the tenth and succeeding centuries have been found in Gothland, to say nothing of vast numbers of Byzantine, Arabic, and Roman coins, some of the latter dating from before the Christian era.

strongholds of the kings of the Ynglinga dynasty, the most powerful race in the Scandinavian peninsula, and originators of the future royal line of Norway, as well as of the kings of Jutland. From Björkö the Viking trader carried his goods, almost entirely by water, to the inland marts of Telge (Södertelje), Strengianes (Strengnäs), or Thorsburg (Thorshälla)—all three on Lake Mälars,—or to Liongaköpunger (Linköping) or Skara, lying east and west of Lake Wetter. Or he sailed south and west, and jostling his rival from Bornholm, put in at Lund, then a large and important trading-town close to the sea, or at Skanör, thrust out into the southern entrance to the Sound, or at Haleyre (or Halöre), which stood on or near the site of the modern Helsingör (Elsinore). Hence he might coast along the north of Zealand until he came to Hleidr (or Hleidra), at the head of Roskilde Fjord, or along the west coast of Sweden, which was then a possession of the Danish king, and go up the Göta river to Konungahelle (Kongehelle) or Ljodhuus (Lödöse), the predecessors of the modern Gothenburg; or pushing on still farther, he might put in at Sarpsborg (also Borg), that is if his wayfaring took place after the year 1016. Anterior to that date he would be more likely to strike across the Vik¹ for Skiringssal (now Kaupang), the oldest trading-place of Norway, as well as the most sacred shrine in the south. This town was situated on the east side of Larvik Fjord; but even before the Viking period came to an end Skiringssal was supplanted by Tunsberg (Tönsberg), 50 miles farther north.

¹ It is from this word that "Viking" is in all probability derived, the meaning being thus "a man of the Vik." The same word recurs in the suffixes -wick and -wich in many English place-names, and is not unknown as a prefix, e.g. in Wigtoft, near Boston in Lincolnshire. At all events an etymology Vi-king, such as the current English pronunciation would imply, is as unsound as it is meaningless.

Amongst the most important articles of commerce in those days were thralls, *i.e.* slaves, mostly prisoners of war or captives taken in Viking raids; then furs, weapons of iron and bronze, armour of silver, bronze, iron, and other metals, personal ornaments in gold and silver, cloth and clothing, fish, grain, honey and wax, salt, wine, and skins.

At this period there do not seem to have been any very notable centres of traffic on the west coast of Norway. But at Hladir or Lade, immediately east of the present city of Trondhjem, and situated in the midst of a relatively dense population, there was a famous temple of the gods, which, when Christianity began to assert itself in the North (end of tenth century), became the rallying-point of the heathen party in Norway, just as at a somewhat later date Upsala did in Sweden. And even after Norway was finally Christianised, Nidaros, which was founded (997) on the site of the subsequent Trondhjem, remained, as the place of burial of St. Olaf, the religious capital of the country; again, precisely as Upsala did under similar circumstances in Sweden. Indeed, for many years, until well on in the Middle Ages, Nidaros was also the political capital of the country. The early trading-towns of Denmark are mentioned below, pp. 704, 707.

The Viking Age was followed by what may be called the Hanseatic Period, in which the centres of gravity of northern commerce were to some extent shifted. During this period, which may be said to have lasted on into the sixteenth century, the trading-towns in most repute in Scandinavia were Wisby, Stockholm (founded after the burning of Sigtuna by Baltic sea-rovers in 1187),¹ Konge-

¹ The common tradition is, that Stockholm was founded by Birger Jarl about 1255. The statement in the text rests upon the weighty authority of Dr. Oscar Montelius (*Nordisk Tidskrift*, 1898, p. 81).

helle, Oslo (founded after the middle of the eleventh century, a little to the east of the present Christiania), Tönsberg, and Björgvin (afterwards Bergen). The Hanseats at the last-named not only made themselves complete masters of the town, as some believe the Hanseatic factory did at Wisby, but they held all the north and west of Norway in a sort of commercial bondage, from which the Norwegians did not succeed in freeing themselves until the middle of the seventeenth century. In the eleventh and twelfth centuries, and thence on to the Reformation, there were a host of busy little trading-ports on almost every creek and bay of the ragged coasts of the Danish isles and Jutland. The activity of these places was no doubt stimulated by the herring fishery in the Sound and neighbouring waters, an industry of especial importance during the five or six hundred years in which the Church, with her fastings, was all-powerful throughout Europe. The Swedes and Norwegians, like their kinsmen the Danes, belong now almost exclusively to the Lutheran Church.

10. Modern Resources and Towns (Norway)

Norway derives her wealth from her fisheries, her forests, and from seafaring pursuits. Her mineral ores, her ice, her manufactured products, such as wood-pulp, calcium carbide, bricks, hewn granite, paper, boats, and preserved foods, and her agricultural produce (though less than 4 per cent of the total area is cultivated) contribute the secondary articles of commerce. In her waterfalls, and possibly also to some extent in her undeveloped mineral resources, Norway possesses assets of probably no inconsiderable value. At Sarpsborg, Skien, Stavanger,



Trondhjem, and other places, the waterfalls have been already harnessed in the service of industry.

The Norwegians are still pre-eminently a people of the sea. They dwell almost entirely along its shores, and a large percentage of them gain their livelihood, or part of it, either by fishing or by owning vessels or navigating them. In 1900 Norway had twenty-two towns each with



BERGEN.

more than 5000 inhabitants; of these, all except one (Kongsberg) were situated on sea, lake, or navigable river, and only two (Kongsberg and Hamar) were not on or close to the sea.

The four largest towns of Norway are Christiania, the capital, Bergen, Trondhjem, and Stavanger. *Christiania*¹ was founded, after Oslo was burned down, in 1624, and

¹ Pop. (1801), 12,000 ; (1855), 40,000 ; (1900), 226,000.

though at that time Norway was politically united with Denmark, a union which lasted altogether from 1380 to 1814. Christiania is the centre of the intellectual and artistic life of the country, the first place in importance in manufacturing industry, the headquarters of the timber trade, and the financial capital; but as a ship-owning port it ranks second, coming after *Bergen*.¹ Bergen is also the chief emporium for the distribution of



TRONDHJEM.

cured fish, and the seat of shipbuilding, engineering, and other local industries. On both sides of Christiania Fjord there are a number of busy little industrial towns, of which *Fredrikshald*² (at the siege of which Charles XII. of Sweden was shot in 1718), *Fredrikstad Drammen*,⁴ *Laurvik*⁵ or Larvik, and *Skien*⁶ are the ones with a population exceeding 10,000. In the timber is sawn and worked, ice is stored and ship

¹ Pop. (1801). 18,000; (1900), 72,000.

² Pop. 12,000

³ Pop. 15,000.

⁴ Pop. 23,000.

⁵ Pop. 11,000

⁶ Pop. 11,000.

bricks are made, granite and felspar are quarried, wood-pulp, calcium carbide, paper, condensed milk, tobacco, cotton, glass, boots, beer, and other commodities are manufactured, boats are made, metals worked in engineering-shops, forges, etc., flour ground, and so forth.

*Tönsberg*¹ is the headquarters of the Arctic fishing fleet. *Stavanger*,² which boasts of a small cathedral, has



TRONDHJEM CATHEDRAL.

a trade in fish, and is developing various industries. *Trondhjem*,³ whose principal attraction is the fine Gothic cathedral of St. Olaf (see above, p. 683), the pride of the whole country, and the place of coronation of her kings, is also a town with shipping, commercial, and industrial interests. *Hammerfest*,⁴ although small, plays

¹ Pop. 8500.

² Pop. 31,000.

³ Pop. 38,000.

⁴ Pop. 2300.

an important role as a place of call for Arctic expeditions, and for vessels engaged in the Arctic fisheries; it boasts that it is the most northerly town in the world ($70^{\circ} 40' 11''$ N. lat.). *Horten*,¹ on Christiania Fjord, is the headquarters of the Norwegian navy. Other seaport towns deserving of mention are *Christiansand*,² *Arendal*,³ *Aalesund*,⁴ *Christiansund*,⁵ and *Tromsø*.⁶

11. Modern Resources and Towns (Sweden)

Sweden possesses greater natural resources than the sister kingdom. Although her fisheries are less valuable, and her shipping less, on the other hand the exploitation of her forests, her mines, and her agriculture, her manufacturing industry, and consequently her commerce, are all conducted on a larger scale than they are in Norway. Considerably more than one-half of the population get their living from agriculture, although only 12 per cent of the total area is cultivated. Forests cover nearly one-half of the surface of the country (in Norway one-fifth). Swedish industry more than supplies the needs of the native population, and provides for export matches (at *Jönköping*⁷ and *Tidaholm*), wood-pulp (in all parts, but especially in the counties of Vermland, Gefleborg, Elfsborg, and *Jönköping*), paper (all the southern counties), steel and other worked metals, machinery, etc. (Stockholm, Malmö, *Jönköping*, *Eskilstuna*,⁸ *Motala*, *Lund*, *Gothenburg*, *Carlstad*); joinery, furniture, wood-carving, etc. (Stockholm, *Gothenburg*, and other places); beetroot sugar (Malmö and other towns in *Skåne*), butter and margarine (*Gothenburg*, Malmö, *Landskrona*, and

¹ Pop. 8500.

² Pop. 15,000.

³ Pop. (1902), 11,000.

⁴ Pop. 12,000.

⁵ Pop. 12,000.

⁶ Pop. 7000.

⁷ Pop. 23,000.

⁸ Pop. 14,000.

Helsingborg), and glass (various places). For home consumption the branches most actively pursued are the manufacture of woollens and cottons (Norrköping, Borås, Stockholm, Gothenburg, Malmö, and Halmstad), tobacco (Stockholm, Gothenburg, and Malmö), spirits and beer, pottery and porcelain (the latter at Stockholm), chemicals, and machinery. The most widely spread industry is perhaps saw-milling. The quarrying of granite is carried



STOCKHOLM.

on on a large scale between Gothenburg and the Norwegian frontier.

Stockholm,¹ the capital of Sweden, is one of the handsomest cities in Europe. It stands on a few islands in the outflow channel of Lake Mälär, and on the rising ground north and south of it. On the west is Lake Mälär, with its thousand creeks and bays and beautifully wooded islands; on the east the tranquil and picturesque beauties of the Skärgård, stretching 30 miles out to sea.

¹ Pop. (1805), 72,500 ; (1870), 136,000 ; (1900), 300,600.

But not the least charm of Stockholm lies in the fact that it has several remarkably fine buildings (*e.g.* the Royal Palace, National Museum, Opera House, Riddarholm Church, new Parliament Houses, new Bank of Sweden), standing at the water's edge, and that the largest vessels come up to the fine stone quays in the very heart of the city.

Although founded more than 800 years ago (see p.



GOTHENBURG.

683 above), Stockholm was not made the capital until the sixteenth century. *Gothenburg*¹ is a clean, Dutch-looking town, its principal streets wide, with canals down the middle and rows of trees at the sides. It was founded by Gustavus Adolphus in 1619, and counted amongst its first citizens merchants of Scottish, German, and Dutch nationality. Owing to its exceptionally favourable position on the Kattegat, it is the chief exporting port of

¹ Pop. (1805), 12,500 ; (1850), 26,000 ; (1870), 72,000 ; (1900), 130,500.

Sweden, as Stockholm is the chief importing port. As a manufacturing centre it is outstripped by Stockholm only. Its inhabitants are noted for their public and progressive spirit. Although the Gothenburg system of licensing the drink traffic did not originate here, but at Falun, and apparently also at Marstrand, about the year 1850, still it was the practical development which it underwent in this city that has given it its name. The prosperity of *Malmö*,¹ the third city of the kingdom, dates from 1864, when it was made the Sound terminus of the southern trunk line from Stockholm. The Earl of Bothwell, who played such a lurid rôle in the history of Mary Queen of Scots, was imprisoned in the castle here from 1567 to 1573. *Norrköping*,² the fourth town in point of population, might be called the "Bradford" of Sweden. *Gefle*,³ *Helsingborg*,⁴ *Halmstad*,⁵ are active sea-ports, with some industry. Gefle, on the Baltic coast, north of Stockholm, exports large quantities of timber, and is one of the chief shipping ports for the iron and copper of Central Sweden. Helsingborg and Halmstad, both on the Sound, are with Malmö the ports of the rich agricultural district of Skåne. The coast from Gothenburg to Stockholm is studded with lively little harbours, of which it is enough to mention *Landscrona*,⁶ Trelleborg (the landing-place in the Berlin-Warnemünde-Stockholm express route), *Christianstad*,⁷ *Carlsrona*,⁸ (the headquarters of the Swedish navy), and *Calmar*.⁹ Calmar, which has existed since heathen times, possesses a cathedral and a strong fortress; the latter has figured very conspicuously in Swedish history, especially as the

¹ Pop. (1805), 5000 ; (1850), 13,000 ; (1900), 61,000.

² Pop. (1805), 9400 ; (1900), 41,000.

⁴ Pop. 25,000.

⁵ Pop. 15,000.

⁷ Pop. 10,000.

⁸ Pop. 24,000.

³ Pop. 30,000.

⁶ Pop. 14,000.

⁹ Pop. 13,000.

whereby Denmark, Sweden, and Norway were united under one sceptre. *Upsala*¹ and *Lund*² (see above, pp. 681-2) are the seats of the two Swedish universities. Both are inland towns; as also are *Örebro*,³ *Westerås*,⁴ *Carlstad*⁵ and *Borås*.⁶ Of the seaports north of Gefle, *Sundsvall*⁷ ships large quantities of timber; and *Luleå*⁸ is the port whence the iron ore of the Gellivare and other Lapland mines is exported.

12. Lapland—The Lapps

Lapland is an ethnographical rather than a geographical term. The Lapps, from whom the name is derived, were formerly an exclusively nomad race, wandering with their reindeer herds, in which their wealth chiefly consists, from the White Sea to the Atlantic. These people belong to the Ugro-Finnish division of the human family. Formerly the accepted view of their history was, that they were the original inhabitants of the Scandinavian Peninsula, and were driven northwards when the Aryan ancestors of the Swedes and Norwegians crossed the Sound and established themselves in the country. But the investigations of modern Scandinavian inquirers (Düben, Yngvar Neilsen, and Wiklund⁹) do not support this theory. On the contrary, from the Stone Age downwards, the Lapps, as they increased in numbers, have been penetrating farther and farther south. In 1600 their southern limit

¹ Pop. 23,000.

² Pop. 17,000.

³ Pop. 22,000.

⁴ Pop. 12,000.

⁵ Pop. 12,000.

⁶ Pop. 16,000.

⁷ Pop. 15,000.

⁸ Pop. 9500.

⁹ See *Nordisk Tidskrift* (1895), pp. 373, 374, and (1898) pp. 481-485, 517-537.

was a little above 64° N. lat. ; in 1780 they were in the



LAPPS.

neighbourhood of Røros and Lake Fæmund in the east of Norway ; in 1810 they crossed the river Glommen ; and

by 1890 they had forced their way to the districts around the head of Hardanger Fjord, in about 60° N. lat. In Sweden they are recorded as being in Jemtland, about 63° N. lat., in 1564; by 1697 they had reached the valley of the Ljusna, in 62° 25' N. lat.; and in 1881 they were met with in Dalecarlia, in about 61° 45' N. lat. At the present time the Lapps are rapidly abandoning their nomadic habits, taking to more settled modes of life, and in Sweden intermarrying with the Swedes and Finns, amongst whom they live. In Norway the Lapps are distinguished as Mountain Lapps, who still cling to the nomadic habits of their forefathers, and Sea Lapps, who have partly adopted a settled mode of life and win a hazardous sustenance by fishing. The personal and social habits of the last class of people are described¹ in anything but agreeable colours. In 1891 the total number of Lapps within the boundaries of Norway was about 21,000 (as compared with 4000 in 1567 and 7000 in 1724, and 19,550 in 1900), of whom not more than one-tenth still led the nomadic life. In Sweden the total number was put at about 7000. In addition to these there are probably 3000 Lapps in Russian Lapland.

But whilst the nomadic Lapps are pushing southwards and westwards, led by the quest of fodder for their reindeer, the Norwegians and the Swedes have for some 400 years been as steadily pushing northwards. On the one side of the peninsula the Norwegians, ever since the Reformation, have been slowly creeping up the west coast; and from 1751 to 1810 the Danes used the Norwegian counties of Finmark, Tromsö, and Nordland as a place of transportation for long-term convicts. On

¹ By Dr. Hans Reusch, *Folk og Natur i Finmarken* (Christiania, 1895).

the other side, although the colonisation of the Bothnic coast began shortly before the middle of the seventeenth century, it was not until the nineteenth century, and especially the latter half of it, that the Swedes really began to settle in Lapland. In 1895 there were only three districts in which the Lapps preserved the majority—namely, Karasjok and Kautokeino in Norway, and Enontekis, the most northerly parish of Sweden. Out of the five districts into which Swedish Lappmark was administratively divided, nomad Lapps exist now in three only (Lycksele, Pite, and Torne). In Lule Lappmark they have almost all adopted settled habits; and in the remaining division, Åsele Lappmark, the last Mountain (nomad) Lapp died between 1880 and 1890.

The low table-land of Lapland is also inhabited by another race, ethnologically not very far removed from the Lapps—namely, the Finns. These people have formed a pretty compact colony in Torne and Lule Lappmark in Sweden since at least the second half of the fourteenth century. Altogether there were in Sweden in 1890 over 21,000 persons who spoke Finnish as their mother tongue. The Finns are not known to have settled in Norwegian Finmark before 1750. At the census of 1891 they numbered close upon 9500 (7770 in 1900), and were established most densely in the neighbourhood of the Varanger Fjord, their principal town being Vadsö.

CHAPTER XXXIX

DENMARK

1. Physical Characteristics—Jutland Heaths

THE present kingdom of Denmark is but the torso of what it was once. Canute the Great in the eleventh century ruled over England, Denmark, and Norway; and Waldemar the Victorious in the thirteenth extended his sway as far as Esthonia, and made the Baltic, at least for a time, a Danish sea. In the middle of the sixteenth century the kingdom of the Danes stretched from the North Cape to the river Elbe, and embraced not only Norway, but also the southern provinces of Sweden—namely, Bohus, Halland, Skåne, and Blekinge. And although these four provinces were lost in 1658 and 1660, after being in the Danish possession for probably over 2000 years, Norway remained united with Denmark down to 1814, and with the duchies of Schleswig and Holstein down to 1864. At the present time the kingdom of Denmark¹ consists of the islands of Zea-

¹ In 1900 the area of the entire monarchy amounted to about 756,000 square miles, and the population to 2,582,600, thus distributed—Denmark proper, 14,840 square miles, 2,449,500 inhabitants; the Faroes, 510 square miles, 15,200 inhabitants; Iceland, 40,450 square miles, 76,400 inhabitants; Greenland, about 700,000 square miles, 11,000 (1899) inhabitants; West Indian Islands, 150 square miles, 30,500 inhabitants. Population of Denmark proper:—929,000 (1801); 1,608,400 (1860);

land (Danish, *Sjælland*), Funen (*Fyn* or *Fyen*), Laaland or Lollond, Falster, Langeland, Möen, Ærö, Taasinge, Samsö, Bornholm, and some smaller islands, Jutland (*Jylland*) on the mainland, and the Faroe Islands in the Atlantic; further, the dependencies of Iceland, Greenland, and St. Thomas, St. John, and Sainte Croix,—these three islands in the West Indies.¹

The islands (excepting Bornholm) and Jutland belong almost entirely to the great North German plain, the characteristics of which have been described in vol. i. pp. 478-481. The surface of the islands and of the greater part of the eastern side of Jutland consists of clay and sand, resting upon a Cretaceous formation, which crops out in fantastically carved sea-cliffs, similar to those of the Stubbenkammer of Rügen, on the east of Möen. In general, these parts are fertile, and well adapted for growing corn and for pasturage. The scenery is, on the whole, pleasing, its dominant feature being a rich pastoral beauty, diversified by numerous low hills and plentiful patches of wood, the beech growing with especial luxuriance. The view, as seen from the top of Himmelsbjerg (535 feet), the second highest eminence in the country—the absolute highest being its near neighbour Ejer Bavnehöi (565 feet)—is typical not only of Eastern Jutland, but also of the more attractive parts of the islands. “Eastwards there is a pleasant intermingling of undulating fields, patches of forest, some large, some small, rural villages, and churches innumerable: and so it continues as far as the eye can reach. In the far, far distance, the view is terminated by the swelling

2,172,400 (1890); 2,449,500 (1901), giving a density of 165 inhabitants to the square mile. .

¹ In 1902 negotiations were in progress for the sale of the three Danish West Indian islands to the United States.

ground, and made the landscape very open, looking to the other quarters of the compass, you find the view restricted in more than one direction. In the north-west the wide-stretching woods look like a vast rolling sea of greenery. On the south they sweep up to the hill-foot, and climb far up its side."¹

The middle and west of Jutland wear a very different aspect. For the most part the coast is low, and in many places swampy,—often broken by wide, shallow lagoons (e.g. Ringkjöbing Fjord, Nissum Fjord, and Lim Fjord), and backed throughout by sand-dunes. Lim or Liim Fjord is rather a strait, cutting right through the peninsula and connecting the Atlantic with the Baltic. Behind the sand-dunes stretch miles upon miles of barren heath, or rather this was the case until long past the middle of the nineteenth century. But since 1866, chiefly through the instrumentality of the truly national and patriotic Heath Society, guided by Colonel Dalgas, and with the assistance of annual grants of money by the Danish Government, altogether over 981,000 acres of this former desolate region have been rendered in part cultivable. This excellent result has been achieved by planting trees (mountain pine and common fir), by constructing irrigation canals, by reclaiming the bogs, of which there is a goodly number throughout the west and north of Jutland, by planting live fences and protective scrub in exposed situations, by spreading marl over the heath-land, and by constructing light railways, chiefly for the purpose of carrying the marl.² As a consequence of these praise-

¹ H. Nutzhorn, in *Aarbog for Dansk Kulturhistorie*, 1893, p. 99. Compare also S. S. Blicher, *Oldsagn paa Alheden*, and other sketches and tales, in *Samlede Noveller og Skizzer* (Copenhagen, 1882).

² From information kindly furnished by Herr Borch, Director of The Danish Heath Society. Compare A. Oppermann, "Dalgas og Hedeplantningen" in *Tilskueren* (Copenhagen, 1894), pp. 425 *et seq.*

worthy efforts, the rural population of the three bailiwicks of Viborg, Ringkjöbing, and Ribe, in which the barren heaths are mostly situated, grew faster than the population of any other part of Denmark, namely from 181,000 (44·3 inhabitants to the square mile) in 1860 to 313,800 (76·8 inhabitants to the square mile) in 1901. The discovery of buried trees (as, for instance, when the harbour was made at Esbjerg in 1868-88), and several other indications, go to justify the popular tradition that in former ages Jutland was covered by forests (oak, etc.).

The seas around the Danish coasts are shallow (see vol. i. pp. 16 *et seq.*); and in spite of the numerous lighthouses with which the coasts are studded and the many snug little harbours on both islands and mainland, navigation is dangerous, and not only for the reason just mentioned, but also because the currents which sweep through the Sound, the Belts, the Kattegat, and other sea-channels are generally swift, and sometimes, when wind and stream are contrary, turbulent. But the ice in winter is less formidable than it used to be. With the help of large modern steam-ferries, aided if need be by powerful ice-breakers, railway communication between Copenhagen and Malmö, or between Helsingör and Helsingborg, as well as across the Great Belt (Korsör to Nyborg) and the Little Belt (Strib to Fredericia), is hardly ever interrupted. The passage of the last named ($1\frac{3}{4}$ mile across) is now usually done in ten minutes, a striking contrast to the "ten hours, tacking without ceasing, to gain the shore," which it cost Mary Wollstonecraft on her return home from Norway in 1796.

2. Climate

The climate calls for little remark. It is, on the whole, fairly uniform and tolerably temperate, the natural continental conditions being modified by the insular and maritime position. The annual mean temperature ranges from $43\frac{1}{2}^{\circ}$ to $46\frac{1}{2}^{\circ}$; for Copenhagen it is $45\frac{1}{2}^{\circ}$. The rainfall varies between 27 inches in West Jutland and 22 inches in Zealand. The rawest winters are experienced in western and central Jutland (January mean $29\frac{1}{2}^{\circ}$), where it freezes on an average between 100 and 125 days in the year. In the spring also Jutland is swept by dry cold winds from the north-west; and in the summer the west side of the peninsula is exposed to chilling sea-mists (*havguse*), which set in suddenly just before sunset.

3. Agricultural and other Industries

Denmark is pre-eminently an agricultural country. Notwithstanding the barren heaths, dunes, bogs, and lagoons of Jutland, close upon 75 per cent of the total area of the kingdom is under cultivation, of which 7 per cent represents woods and forests; and the area is increasing. The open-field system, described on pp. 287-91, only began to be departed from in Denmark in the second half of the eighteenth century, and it is not altogether done away with yet. Until well into the nineteenth century it was customary for the tenants (peasants and cottars) to pay their rent partly in kind, partly in labour on the farms which the land-owner kept in his own hands; nor was forced labour, often of an arbitrary character, abolished or regulated until the same period. But since then a relatively

large area of the cultivated land has passed into the hands of peasant proprietors. Shortly after the loss of Schleswig-Holstein, Danish agriculture started upon a new development. As the years went on, less energy was devoted to the growing of corn, and more and more attention given to the breeding of live-stock, and to the preparation of foods from them and their products. The branch of agriculture which led the way was dairy-farming, chiefly by means of co-operative butter factories. And growing out of this, as being the most profitable way in which to utilise the waste from the manufacture of butter, the rearing and slaughtering of pigs has developed into a great industry. In 1901 Denmark possessed no less than 1200 co-operative dairies and 25 co-operative slaughter-yards for killing pigs, besides a dozen others conducted on non co-operative principles. The success of the new departure is well illustrated by a comparison between the export of surplus agricultural products in 1866, the value of which was less than £780,000, and the export of the same commodities (butter, bacon, eggs, live animals, and meat) in 1900, when the value amounted to £13,720,000. The success of the "new" Danish agriculture is due, in the first place, to intelligent co-operation and the application of scientific principles, but in no small degree to the scrupulous regard to cleanliness, the painstaking attention to details, and the conscientious maintenance of purity and a rigid standard of quality, this last carefully enforced indeed by a watchful government.

Although not a manufacturing country in the economic sense, Denmark has, nevertheless, some busy industries connected with her paramount interest, such as margarine factories, beet-sugar factories, breweries, and distilleries. She also possesses a few other considerable industries,

chiefly for the supply of her own population, as iron-works, engineering shops, manufactures of clothing, linens, and boots, tobacco and cigar factories, porcelain and paper factories, and shipbuilding yards.

Denmark possesses a considerable source of wealth, only in part utilised, in her fisheries; and in connection with this it is interesting to note that the Sound dues (which were abolished only in 1857) originated, according to Professor Schlegel, out of the protection which Denmark originally afforded against pirates and free-booters to vessels engaged in the great herring fishery; for between the twelfth and the sixteenth century the great shoals of herrings which now resort to the West coast of Norway used to come inside the Baltic.¹

4. The People—Towns

The oldest evidences of prehistoric man in Denmark, the refuse heaps of shells, stone chippings and implements, and bones of wild animals known as kitchen-middens, are generally assigned to the later portion of the Stone Age. Of these an unusually large number has been discovered; but Denmark is even richer in remains of the Bronze and the Iron Age. In the second century B.C., the peninsula of Jutland was, according to Roman writers, inhabited by the Cimbri, whence the name of the Cimbric Peninsula (*Chersonesus*) sometimes given to Jutland. But who the Cimbri were is uncertain. Like the Swedes and the Norwegians, the Danes are a Teutonic people.

The authentic history of the Danes begins with the records of the Viking Age (700 B.C. to about 1050 A.D.),

¹ See *British Diplomatic and Consular Reports*, Annual Series, No. 1138 (1892), pp. 6, 7.

though the Saga chronicles have much to tell of a "heroic" period, which ushered in the true historic period, and of which Ragnar Lodbrok is perhaps the most conspicuous figure. The principal trading-towns of Zealand have been already named (p. 682 above); to them must be added, as probably the most frequented trade-centre in the western Baltic, at all events as the most frequented in the Chersonese Peninsula, Heidaby or Hede, the modern Schleswig; and on the North Sea coast it had an eager rival in Ribe. Out of twenty-six towns, each with more than 5000 inhabitants in 1901, all except four were virtually maritime towns.

If it is in any sense true that Paris is France, it is also true, and for very similar reasons, that *Copenhagen*¹ (Danish, *Köbenhavn*²) is Denmark. It is, indeed, the only really large town in the country, though Aarhus is growing fast. Copenhagen was at first a small trading-place for the sale of the fish caught in the Sound, and in the second half of the twelfth century was fortified and protected by a citadel. It was not, however, chosen as the royal residential town until nearly three hundred years later. Its history is marked by two periods of expansion, one in the seventeenth, the other in the nineteenth century. The city wears a modern aspect, and was indeed for the most part rebuilt after fires in 1728 and 1795, and after the English bombardment in 1807. It is the seat of the only Danish university; and it possesses treasures of incalculable value for the history of the North in its Royal Library and National Museum, besides good picture galleries and Thorwaldsen's

¹ Pop. (1635), about 25,000; (1835), 120,000; (1880), 235,000; (1901), 378,000; or including suburbs, 476,800 in 1902.

² *Köben* or *Kjöben* = English "Chipping," as in Chipping Barnet, and means "trading;" "chipping" being cognate with the word "chapman," a trader. The original name of Copenhagen was indeed *Köpmannähavn*.



VOL. II

Museum (sculpture). In 1894 a portion of the harbour was declared a free port. *Aarhus*,¹ the second town of the kingdom—*Frederiksberg*² is practically a suburb of Copenhagen—is the principal port of Jutland, a position it owes to its excellent harbour, and also, as a conse-



MARKET PLACE, COPENHAGEN.

quence of this situation, to the fact that it is the converging point of the chief Jutland railways. If, however, *Esbjerg*,³ the new port at the extreme south-west corner of Jutland, continues to grow with the same

¹ Pop. (1870), 15,000 ; (1901), 52,000.

² Pop. 76,000.

³ Pop. (1868), 13 ; (1880), 1529 ; (1901), 13,000.

rapidity as it has since 1888, when the harbour was finished, it bids fair to deprive Aarhus of its position as the commercial capital of the peninsula. This rapid growth is entirely due to the export trade with England. The coasts of both the islands and Jutland are dotted with small sea-ports—*Aalborg*,¹ *Horsens*,² *Randers*,³ *Vejle*,⁴ *Kolding*,⁵ *Svendborg*⁶—all old trading-towns, dating from the first two centuries after the close of the Viking Age.

From very early times until the period of the Thirty Years' War, Ribe, Nyborg, and Ringsted were alternately or successively the favourite place of residence of the Danish kings; though the three most important towns were, in order, Schleswig, Roskilde, and Ribe. *Roskilde*,⁷ which takes its name from a mineral spring called the Rose Spring (*kilde* = "spring"), preserves a noble memorial of its former greatness in its thirteenth-century cathedral. *Odense*,⁸ presumably a religious centre especially dedicated to the worship of Odin, was at any rate a notable place in very early times, and even as late as the tenth century; but in the Middle Ages its reputation was still further enhanced by its sheltering the bones of St. Canute, an object of attraction to thousands of pious pilgrims. *Helsingör*,⁹ the Elsinore of Hamlet, used to collect the Sound dues until their abolition in 1857. The existing castle was built on the site of an older one in 1577-85; and it is interesting to know, that English actors performed in Helsingör in the very year the frowning keep which crowns

the dreadful summit of the cliff
That beetles o'er his base into the sea

¹ Pop. 31,500.

² Pop. 22,000.

³ Pop. 20,000.

⁴ Pop. 14,500.

⁵ Pop. 14,000.

⁶ Pop. 11,500.

⁷ Pop. 8400.

⁸ Pop. 40,000.

⁹ Pop. 14,000.

was finished.¹ *Fredericia*² was founded by King Frederick III. (seventeenth century) as a "watch-dog" over the Little Belt. *Frederikshavn*,³ twenty-four miles south from the Skaw (Danish, *Skagen*), was, previous to 1818, a mere fishing-hamlet named Fladstrand; at the present time it is a busy fishing port, and here in 1882-91 was built a large harbour of refuge for the Kattegat. The most noteworthy of the inland towns is *Viborg*,⁴ the ancient capital of Jutland, and one of the oldest towns in the kingdom. It was no doubt a religious centre in heathen times; at least its name points to that conclusion, as also does the fact that when Christianity was established in the country it was chosen as one of the first episcopal sees.

5. Bornholm

Bornholm is geologically an outlier of the Scandinavian Peninsula, and in this respect is in striking contrast with the Danish islands, from which it is 100 miles distant, whereas from Sweden it lies but 25 miles. The north coast is steep, though not very high; the interior of the island is in part barren, or covered with heath, though of recent years attempts have been made, and not unsuccessfully, to plant it with forest-trees and to reclaim it to cultivation. The animal life presents several features of interest. Known in the Sagas as Borgundarholm,⁵ this island seems to have been for the western Baltic what the island of Gothland (*Eygötaland*)

¹ See further particulars in *Die Schauspiele der englischen Komödianten*, ed. by Prof. Dr. W. Creizenach (Berlin [1889]), Introduction.

² Pop. 13,000.

³ Pop. 6500.

⁴ Pop. 8500.

⁵ For its close relations with the Viking sea-stronghold of Jomsborg, in the land of the Wends, near the mouth of the Oder, see *Olaf Trygvason's Saga*, chaps. lxxxix.-xc.

was for the eastern—the chief emporium of its over-sea commerce. The present chief town, and at the same time one of the oldest places on the island is *Rønne*,¹ on the west coast; it produces porcelain of good repute.

6. The Faroes

Imagine a volcanic plateau, principally composed of basalt, crowning a gigantic ocean ridge (which stretches from Scotland through the Orkneys, Shetlands, and Faroes to Iceland), and trenched by deep steep-sided glens; then suppose the plateau to be partly submerged beneath the sea, so that it becomes carved into a number of separate islands. Such is the physical history of the *Færøerne*, i.e. "Sheep (*faar*) Islands" or "Feather (*fjaer*) Islands." The group, which consists of two dozen islands, of which seventeen are inhabited, and the largest are known as Stromö (144 square miles), Österö, Vaagö, Sandö, Süderö, and Borö (ö = "island"), lie 190 miles north-west from the Shetland group and 600 miles north-west from Denmark. Viewed from the sea, the islands wear a forbidding aspect: rugged, precipitous cliffs tower up to 1000 feet, and from that to 2500 feet, with swift currents racing through the sounds which separate island from island. Inland, the surface climbs by broad terraces to sharp peaks 1200 to 2600 feet in altitude. The loftiest elevation is Slattaretinde (2895 feet)² on Österö. Coal exists on Süderö. The climate is insular—the winters being mild (January mean, 37·8° Fahr.), the summers moist and misty; the average mean temperature for the year is 43·7°. The rainfall averages 62

¹ Pop. 9000.

² Determined by the Danish General Staff (see *Geografisk Tidsskrift*, 1895-96, Copenhagen).

inches annually. The wind often blows with great violence and storms are frequent. Owing to this, trees do not grow ; but grass does, and on this the people feed their sheep, these constituting one of their chief sources of wealth. Carding, spinning, knitting, and weaving the wool gives employment to both men and women during the long dark winter evenings. But the Faroe islander derives his sustenance in an even greater measure from the sea. "The sea is his harvest field. . . . It is as fisherman and birdcatcher that he excels. It is an endless pleasure to watch him, whether he be handling the oar or the rudder, cleaving now and again with the former a breaker surging off his rock-bound coast and threatening to swamp his boat, or easing the latter as a blast of wind fills his little brown sail, as if intending to capsize his craft in the midst of turbulent eddies, where currents race at nearly 10 knots an hour, or whether he be hanging in mid-air, sky above and surf below, with myriads of angry and bewildered sea-fowl flying around him, forming as it were a living snow-storm, while he deftly catches them in his fowling-net or removes their eggs from their nesting-places."¹ Cod, coal-fish, halibut, herrings, and plaice are the fish he takes, but more especially the first-named. The puffin chiefly, but also the auk, kittiwake, eider and other ducks, and guillemot are the victims of his fowling skill. The people, descended from Norse Vikings, who settled on the islands after the middle of the ninth century, are a primitive, healthy, well-educated race, clean and hospitable in their habits, and innocent of crime. Danish is the official language, but the inhabitants use a native dialect, developed from Old Norse. They belong to the

¹ Mr. Consul Villiers, *British Diplomatic and Consular Reports, Annual Series*, No. 2589 (1901), pp. 4, 5.

Lutheran Church, and are directly represented in the Danish Parliament. Since 1860, the population has grown faster than the population of the mainland. The chief town is Thorshavn, with a population of 6700 in 1901. The islands have been united with Denmark since 1380.

¹ In 1860, 8922 ; 1890, 12,955 ; 1901, 16,955.

CHAPTER XL

ICELAND

1. Physical Characteristics

ALTHOUGH one of the largest islands in Europe, Iceland is relatively one of the least known. This is due in part to its remoteness and isolation—it lies about 500 miles north-north-west from Scotland, and is only 160 miles south-east from Greenland—in part to its geographical character and configuration, which render communication frequently a matter of serious difficulty, and in part to the severity of the climate. Indeed, it is only within quite recent years that the Icelanders themselves have acquired anything approaching to a comprehensive, though still incomplete, knowledge of the interior, chiefly through the exertions of Dr. T. Thoroddsen. It is principally the results of his investigations,¹ extending over more than twenty years, which are digested in the following paragraphs.

Iceland, which has an area of 40,450 square miles, and thus comes in respect of size intermediate between Ireland and England, may, very generally, be described as a tolerably level plateau, ranging between 1300 and 3500 feet in average altitude, and constituting a gigantic

¹ A *résumé* of them is printed in *Geographical Journal*, March and May 1899.

waste—vast lava-fields and ice-plains, “tumbling seas” of boulders, ice-clad volcanoes of exceptional dimensions, which burst into eruption with incalculable caprice and appalling violence—the whole swept by frequent storms of sand or snow, and often shrouded for days together in the chilliest of cold mists. To one standing on the top of Odadahraun, the most extensive lava-field (over 1500 square miles) in Iceland, the view is “the weirdness of desolation itself. As far as the eye can see, the surface of the earth resembles a gigantic stiffened corpse, petrified, black as the night. The only breaks in the grim monotony are a few scattered reddish mounds of slag, brown hills of tuff, and sporadic snow-drifts. Looking southwards you get glimpses of the glittering snow-fields of Vatnajökull; whilst towards the east the sky is obscured by the yellowish brown aerial banks of dust, which have risen off the vast expanses of drift sand that border upon the plateau. Nowhere a vestige of life. An oppressive silence weighs upon the entire landscape.”¹

This inhospitable tableland owes its existence, as well as in great part its surface configuration, to volcanic energy. The two principal rock constituents are (1) basalt and (2) tuff and breccia; though nearly one-half of the entire surface is covered with lava, drift-sand, moraine deposits, and erratic boulders. Both tuff and basalt are of modern (Tertiary) as well as ancient origin. The former extends in a broad belt right across the island from west to east, in a series of ice-clad, dome-shaped mountains, or rather secondary plateaus—Langjökull, Arnarfellsjökull, Tungnafellsjökull, Vatnajökull—which rise 2000 to 3000 feet above the main plateau, and reach absolute elevations of 4500 to 6400 feet above the sea.

¹ Dr. Thoroddsen, *Geog. Journ.* March 1899, p. 270.

Attached to the north-west coast by a narrow isthmus, only 750 feet in elevation and $4\frac{1}{2}$ miles across between the wide bays of Breidifjörð and Húnaflói, is a rugged lateral protuberance, or secondary peninsula, some 3600 square miles in extent, deeply cleft and riven by narrow fjords and glens, the basalt walls of which frequently



CLIFFS (TUFF AND BRECCIA) ON THE COAST AT SKAGI.

tower up straight from the sea to an elevation of 2000 to 2500 feet.

The only tracts of lowland—and there the population are principally concentrated—are in the extreme south-west and in the west. The former district, some 1550 square miles in extent, is an area of subsidence,¹ gradually

¹ Mr. H. Pjetursson seeks to prove that a considerable portion of the tuff and breccia, or palagonite breccia, formation of these lowlands is of glacial, not of volcanic, origin (*Scot. Geog. Mag.* 1900, pp. 265-293).

sloping from sea-level up to a maximum of 1000 feet. This is for the most part overgrown upon which the people feed their sheep, herds. A similar, but smaller (400 square miles), depression lies around the head of the broad bay but does not attain above 100 feet in altitude, almost entirely shut in by a girdle of mountains, 1500 feet or more in height. These regions appear to have been covered by the ice at the close of the Glacial Epoch.

Altogether, the lava-fields of Iceland cover 5000 square miles of the surface. Lava eruptions are tolerably frequent, and within historic times have been several volcanic eruptions of stupendous magnitude, as Mount Katla, in 1721; Mount Hekla (1766, and many other occasions; Mount Skapta, in 1783; Askja, the huge crater, 10 miles in extent and 3000 feet deep) on July 23, 1875, when the pumice which the volcano buried nearly 2000 square miles in the island, and the dust was blown all the way to the coast. The volcanoes of Öraefajökull (6425 feet), Eyjafjallajökull (5595 feet), and others, which are sheathed in ice, have been in frequent activity during the last few years. Earthquake shocks are not uncommon along the coast, around the bay of Faxaflói in the western lowlands. In the last-mentioned districts the most particularly destructive shocks in 1784 and 1826, and in the north the latest catastrophe happened in 1846, beside the Axarfjord. Other evidences of volcanic activity exist in the great number of pits of boiling mud, and hot alkaline and other waters, or geysers, which are scattered all over the island.

Ice also, in the form of modern glaciers and

and more especially through the huge mantle of solid ice which covered Iceland during the Glacial Epoch, has played a scarcely less important part than volcanic energy in modelling and shaping the contour of the island. It is estimated that the existing icefields of Iceland extend over no less than 5550 square miles, or more than one-eighth of the total surface; whereas those of the Alps, in the aggregate, do not much exceed 1160 square miles.



VOLCANO OF SNÆFELLSJÖKULL.

Vatnajökull, which lies along the south coast, is the largest, covering nearly 3300 square miles, and ascending to a maximum altitude of over 6400 feet. The remaining ice-sheets are, however, much smaller, none exceeding 520 square miles. Apart from the sheer incalculable thousands of erratic blocks which litter the surface in many parts, visible proofs of past glacial action exist in the *residua* of ground moraines which help to fill the depressions all over the plateau, in moraine and glacier lakes (*e.g.* Lagarfljót, 25 miles long and 360 feet deep),

and in glacial striations and scourings in the island.

Except on the south, the coasts are rugged, and grandly precipitous; in especial west and east they confront the ocean walls, which shoot up to a sheer vertical



CAPE HORN.

3000 feet, leaving at their foot but the mere a strand, or frequently none at all. The however, presents a marked contrast,¹ having been foundly modified by the sedimentary matter by the glacier streams. These, during the centuries, have not only filled up all the fjords

¹ For some account of this, see a paper by Dr. H. J. in *Scot. Geog. Mag.* (1895), pp. 447, etc.

spread their deposits far out over the floor of the sea, making it comparatively shallow, and creating a heavy inrolling surf.

The climate is damp and raw and cold, the temperature being extremely variable, not only from day to day, but even from year to year, and in the same month throughout a series of years. Although, considering the proximity of the island to the Arctic Circle, the winters are relatively mild, the springs and summers are, in four years out of every five, characterised by an extreme rawness of the atmosphere. This is caused by the presence of drift ice from Greenland off the north coast. Fogs are not uncommon, even in summer.

Lava, sulphur, lignite (*surtarbrandur*), Iceland spar, liparite, and granophyr are the principal minerals; but none is worked on a commercial scale.

Except for a few sporadic patches of ill-thriven grass, beds of sandwort, and dwarf willow copses, the interior is entirely devoid of vegetation. In the lowlands, the commoner vegetables are grown to some extent; but the principal crop is hay.

2. The People—History—Sagas

The Icelanders¹ are of Norse descent. When, towards the middle of the ninth century, Harold with the Fair Hair extended his sway over the whole of Norway, those malcontents who refused to submit to his rule took ship and sailed away westwards across the sea, and finally settled in Iceland. There they found a sprinkling of their own countrymen, who had come directly from Norway, after Iceland was accidentally discovered about the year 870. These two bodies of colonists were sup-

¹ Pop. (1890), 71,000; (1901), 76,500.

plemented by a third, also of Norse origin, from the Norse kingdom of Dublin and the western isles of Scotland. But Iceland appears to have been inhabited even before the first Norseman (Nadd-Odd) saw it—namely, by a small colony of Irish Culdees. All these various people occupied pretty much the same localities as their descendants occupy at the present time. But in one respect the Iceland of those days differed from the Iceland of to-day; “the portion of it which lay between the mountains and the shore was all covered by a low forest growth.”¹ What manner of men these were—impatient of control, self-reliant, gifted with eloquence, with high intelligence, with poetry even, but at the same time turbulent and punctiliously tenacious of their rights, as well as the sort of religious republic they formed loosely bound together by respect for the law, by family loyalty, and by an indifferent reverence for the priestly office, may be read in the sagas—to wit, *The Eyrbyggja Saga*, *The Sagas of Howard the Halt*, of *Egil Skallagrimsson*, of *Grettir the Strong*, and of *Olaf Tryggvason*, the *Heimskringla*,² the two *Eddas*, the *Islandingabok*, *The Story of Burnt Njal*, and others. These, after being circulated orally by the skalds, or wandering minstrel-poets, were written down in the twelfth to the fourteenth century. After a stationary period of some centuries’ duration, the civilisation of Iceland made a notable advance during the last quarter of the nineteenth century. Machinery was introduced for manufacturing the wool, and decked vessels for the fishing at sea. Between 1879 and 1895, the value of real property trebled, and in 1900 there was an over-seas trade of about one million sterling.

¹ *Olaf Tryggvasons Saga*, chap. cxiv.

² Of these works there are English translations in the Saga libraries of Quaritch (London, 1892-95) and Nutt (London, 1895, etc.).

Since 1874, the Icelanders have enjoyed virtual, since 1902 actual, "home rule," and now they legislate on their own affairs under the control of a governor appointed by the King of Denmark. Women vote for the communal and parliamentary representatives. Education, notwith-



AKUREYRI.

standing the extremely scattered character of the population, is at a very satisfactory level. The principal occupations of the people are the keeping of sheep, the breeding of ponies, wild-fowling, and fishing. *Reykjavik* with 6700 inhabitants (1901), is the capital and the see of a Lutheran bishop. The island has belonged to Denmark since 1388.

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